CW SAMPLE COPY
MI48106UIVYMUIVYM FCWB FC
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1975 by Computerworld, Inc.

ar July 2, 1975 Vol. IX, No. 27

A Look at Users' Lib

DOS/VS for 360 Sites Part of Itel Package

By Patrick Ward
Of the CW Staff

SAN FRANCISCO – Itel has bolstered the movement of IBM 370 users back to 360s with an announcement that it will supply its simulated DOS/VS environment to any 360 shop that buys Itel disks, tapes or add-on memories.

Marketed as the DOS/VS and Peripherals (DAP) Box, the package is available for 360/40s, 50s and 65s.

The 360 shop with the DAP Box enhancement "will be able to use exactly the same software and send its staff to the same schools and professional meetings" as the 370 DOS/VS user, Itel said.

A DAP Box-equipped 360 could be used as either a stand-alone 370 equivalent or could back up a 370 and share I/O, Itel stated.

And, with the addition of the DAP Box, "a Model 40 can be as powerful as a 125; a Model 50 more powerful than a 135; and a Model 65 far more powerful than a 145," the firm claimed.

Itel will provide the DAP Box customer with its version of either IBM's Release 29 or 30 of DOS/VS. The firm's newly developed version of Release 30 offers the Power/VS spooler; provides Channel Independent Addressing that allows Sort/

(Continued on Page 2)

The 470s Are Coming (But Not From IBM)

SUNNYVALE, Calif. – The 470 is coming – not from IBM, but from Amdahl Corp., which is set to introduce its large-scale Model 470V/6 within the next few weeks.

The "470" name signifies the machine uses fourth-generation technology and yet is "100% functionally compatible with the IBM 370," an Amdahl spokesman said.

The Amdahl machine will begin a 60-day evaluation at the University of Michigan Computing Center later this month, according to Dr. Robert C.F. Bartels, director of the center.

The National Aeronautical and Space Administration (Nasa) Institute for Space Studies in New York City will also be studying an in-house Amdahl machine this summer.

Bartels said he expects the 2M-byte 470V/6 to be at least 50% faster than the computing center's IBM 370/168.

The computing center plans to move the 370/168's peripherals to the Amdahl machine for the evaluation period, he said.

(Continued on Page 4)

Sent Case Outline to Stockholders

IBM Reprimanded for 'Gag Rule' Violation

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – "The stockholders of IBM stand on a different footing . . . than a general citizen of the country" in regard to the U.S. government's antitrust case against IBM, an IBM attorney contended here recently.

In making the comment, lead IBM attorney Thomas D. Barr argued the firm had a right to inform its stockholders of its side of the case, even though both parties are barred from discussing the case with the press and the general public under a so-called "gag rule."

The incident was precipitated by comments made by IBM's board chairman, Frank T. Cary, to reporters outside the courthouse and by an article in the IBM magazine *Think* which presented an outline of the case.

IBM was arguing it had a right to communicate with its stockholders in spite of the pretrial order that bans communication with the public – an order which IBM originally urged the court to impose despite protest from the press.

Regarding the courthouse interview with Cary, in which he indicated that he was glad the case had come to trial and that IBM had a good case, Judge David N. Edelstein said the comments were neither "wise" nor "prudent."

Furthermore, "I think Mr. Cary and other representatives of IBM ought to be very carefully instructed to refrain from any comment," the judge told the IBM attorneys.

"It is in the interests of this case that Mr. Cary and others in this company and representing IBM be instructed to refrain from any comment," he added.

Referring to the article in *Think* magazine – which was distributed not only to stockholders, but also to members of the trade press – government attorneys said such distribution would be no different than the government "putting out a general bulletin to all points of the government on what it thinks about the case.

"We in the government have a responsibility to the public to keep the public informed too, and specifically authorized [to do so] by Congress. So I am disturbed by the distinction that stockholders at least can be communicated with in a manner that would not be" covered by the court order, Raymond Carlson, lead government attorney, said.

Even though Barr contended the *Think* article was of a general nature, Edelstein said "it went pretty far" and suggested

(Continued on Page 4)

Men-of-the-Year Look to Future

• Ware on Privacy

By Catherine Arnst
Of the CW Staff

SANTA MONICA, Calif. – The issue of privacy "is becoming more important to the public, but it is not becoming more important to the computer industry," according to Dr. Willis H. Ware.

He attributed this to "where we are on the learning curve. Privacy must first become important to those using the industry; then it will translate over to the vendors."

Ware, one of two DPers to be named

(Continued on Page 3)

• Bitzer on CAI

URBANA, Ill. – Computer-aided instruction (CAI) could change the entire concept of education, Dr. Donald L. Bitzer, an expert in the field, said recently.

"It won't replace the teacher, just what the teacher is doing. She won't be paid just to babysit and keep order," he said.

"Education will be more personalized, more individualized. We will be teaching in areas where we never taught before and reaching people who were hard to reach before, such as preschoolers and those out of school."

Bitzer, who, along with Dr. Willis Ware, will be recognized at this week's Info/Expo conference as the Data Processing Management Association's Computer Science Man-of-the-Year, is the developer of the Programming Logic for Automatic Teaching Operations (Plato), a nationwide time-sharing system.

He has been involved in CAI since 1959 and feels it has really come forth recently and will be at a peak by 1980. "By then we hope to have a million terminals hooked into Plato," he said.

The growth of CAI will change society, Bitzer believes. "Currently, 50% of those students coming out of inner-city schools are functionally illiterate, and the inner-city student is very upset about what

(Continued on Page 3)

Davis Urges Positive Approach To Technological Sensationalism

By Ronald A. Frank
Of the CW Staff

GAITHERSBURG, Md. – The progress being made with computer networks "needs to be advertised not as a sensational technology, but as an extremely important technology."

And it is important for all those who are part of the industry to make network breakthroughs less secret and more understood by the press and the public.

These informal remarks were made by Dr. Ruth Davis, director of the Institute for Computer Sciences and Technology at thy National Bureau of Standards (NBS), at the opening session of a recent symposium here on trends and applications in computer networks.

In a direct reference to recent reports about the adverse effects of computer networks by Ford Rowan of NBC news [CW, June 11], Davis said there must be a positive approach to this kind of publicity.

Quoting Rowan as attributing a transfer of secret military files to a key breakthrough made by a "little-known unit of the Department of Defense" Research Projects Agency, Davis said it was "the first time I ever thought a $40 million project [the Arpa network] was little-known."

A technology hasn't arrived "until it has created a set of problems at least as visible as its potential" for good, Davis said, adding that has happened this year in the area of networking.

In a prepared statement, Davis identified two problems related to network usage. Networks allow the sharing of resources and this sharing affords an opportunity to "misuse the technology," she said.

"There is an increasing national concern that we be able to adequately control access to networks," Davis said. "Individuals must be guaranteed their personal

(Continued on Page 4)

S/32 System Software Extended, Boosting Use in 370-Based Nets

By Don Leavitt
Of the CW Staff

ATLANTA – Extensions to the basic system software of the IBM System/32, announced last week by the vendor's General Systems Division (GSD) for delivery over the next year and a half, will be of particular value to installations utilizing System/32s as terminals in 370-based networks.

At the same time, GSD continued its courtship of the first-time DP user by announcing another Industry Application Program (IAP) designed to provide the novice with turnkey support.

The latest IAP, for the small manufacturer, covers nine application areas and will be ready in August, a division spokesman said.

The system add-ons for the more sophisticated user will include improvements in data file inquiry, report writing and data communications facilities for the System/32. The first of these extensions scheduled for delivery – in November – are modifications to the Data File Utility (DFU) routines.

Additional functions for the System/32's previously announced System Network Architecture/Synchronous Data Link Control (SNA/SDLC) batch workstation program and a multileaving remote job entry workstation (MRJE/WS) program that enables the System/32 to function as an RJE point tied to a central

(Continued on Page 3)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM Reg. U.S. Pat. Off.

EDITORIAL
Editor — E. Drake Lundell Jr.
Associate Editor/ Technical News — Ronald A. Frank
Associate Editor/ Hardware — Victor J. Farmer
Associate Editor/ Software — Donald Leavitt
Computer Industry Editor — Molly Upton
Assistant Editor/ Systems — Patrick G. Ward
Staff Writers — Catherine Arnst, Nancy French, Edith Holmes, Toni Wiseman
Chief Copy Editor — Cheryl M. Gelb
Copy Editors — John P. Hebert, Kathleen Quinn
Photography Editor — Ann Dooley
Bureaus:
Europe — J.H. Bonnett
Asia — Hidetsuna Sasaki
Contributors:
Education — J. Daniel Couger
Taylor Reports/Professional Practices — Alan Taylor

SALES
Vice-President/ Marketing — T. Neal Wilder
Sales Administrator — Dorothy Travis
Traffic Manager — Judy Milford
Classified Advertising — Sara Steets
Market Research — Kathryn V. Dinneen

CIRCULATION
Vice-President/ Circulation — Margaret Phelan
Assistant Manager — Barbara Jeannetti

PRODUCTION
Manager — Lee Vidmer
Supervisor — Henry Fling

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529.

OTHER EDITORIAL OFFICES: England: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.
© 1975 by Computerworld, Inc. All rights reserved.
50 cents a copy; $12 a year in the U.S.; $20 a year for Canada and PUAS; all other foreign, $36 a year. Four weeks notice required for change of address.
Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to Walter Boyd.
Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.
Board Chairman/ Publisher — Patrick J. McGovern
President — W. Walter Boyd
Vice-Presidents — Margaret Phelan, T. Neal Wilder
Editorial Director — Dr. H.R.J. Grosch

ABC ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160. ac

Although Verdict Still Not Rendered

IBM-Catamore Case Significant for Users

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – The case of IBM vs. Catamore Enterprises, Inc. could be significant to the user community for a number of reasons, since it lays the groundwork for other potential suits by disappointed users against vendors.

The extent of impact of the Catamore suit depends upon the jury's verdict – and the jury is still out [CW, June 25].

But regardless of the verdict, as Judge Raymond J. Pettine pointed out on the record, the precedent has been set and the groundwork laid, with the use by Catamore of IBM management documents brought to light during the Telex case and through discovery.

Pettine said he feels the "Pandora's box" has been opened and other users with similar grievances will not be deterred from filing suit against IBM if Catamore does not win.

There is a larger issue at hand, however, than the specific instance of unbundling and a user paying more than he thought he would for a DP system.

Catamore asserted IBM is liable for damages incurred because the DP system failed to function as promised. The suit also charged IBM with gross negligence since it did not warn Catamore of the possible risks involved in converting a business to a DP-based production control system.

In a previous case, Carl Beasley Ford vs. Burroughs, a jury held Burroughs liable for the verbal promises of its salesmen and awarded Beasley $56,000 [CW, Nov. 22, 1972]. Burroughs appealed, but judgment was upheld.

On a basic level, Catamore has charged IBM with breach of contract and warranty. As its attorney, Thomas K. Christo, aptly stated in his pretrial brief, "That certain computer equipment [hardware] and certain services were rendered is not in dispute, but what was actually contracted for between the parties, what was warranted and what representations were made are the central issues of this case raised by the defendant's [Catamore's] counterclaims." On these counts, the jury may award Catamore damages.

If the jury finds IBM guilty of fraud or gross negligence, it may award Catamore punitive damages.

But the jury's decision is unlikely to reveal in detail the grounds of its findings. Unlike a judge's decision, a jury is not required to elaborate why it is awarding a particular amount.

For instance, it is unlikely the public will know, in a decision favoring Catamore, to what extent the jury awarded funds to cover the expenditures by Catamore for its DP operations, which were far above those originally anticipated, or for damages it claimed to have suffered in lost business since it did not have an operational production control system when it thought it would.

In the Catamore case, although accountants for both sides essentially agreed on the figures as presented, the case for damages is not simple, as much of it is predicated on predictions of revenues to be gained from entering an additional line of business.

Catamore did indeed embark on the venture of selling jewelry to mass merchandisers in addition to wholesalers, but it claimed that without the production control system it was unable to manually control inventories and fill orders appropriately.

Much of the testimony by Catamore witnesses centered on the existence of both an initial written Machine Services Agreement and an oral Systems Engineering Agreement.

Catamore contended it was promised an operational production control system, including software, since it had no DP capability of its own.

The second level of charges centered around the occurrence of unbundling, or separate pricing of services, effective for Catamore Jan. 1, 1970 and announced in June 1969.

Catamore contended fraud because IBM represented unbundling as a 3% price reduction – rental prices on hardware were reduced 3% – whereas management minutes showed IBM expected to garner increased revenues from the sale of services.

In addition, IBM management planned the unbundling policy well in advance – fall 1968 – unbeknownst to its line personnel and customers. The disparity between the free support the salesmen were promising and management plans for charging for these items constituted fraud, Catamore alleged.

Furthermore, Catamore claimed it was a victim of an IBM corporate policy of "overselling," in which salesmen present a smaller than needed system in order to procure an order.

The technique was referred to in management committee minutes presented by Catamore as evidence in the case.

In Catamore's particular case, a 12K 360/20 was ordered. The initial IBM salesman, Maurice Davitt, assured Robert Catanzaro, president of Catamore, that the system would be sufficient to run a production control system, Catamore alleged.

Witnesses called by Catamore disputed that unit's ability to handle production control.

Davitt changed the order to a 16K 360/20 in December 1969.

An order entry and merchandise control system were delivered in September 1970, but Catamore claimed they did not function properly.

Then a 360/25 was placed on order by Vincent A. O'Reilly, who took over the account. He told Catamore conversion would be minor, the suit alleged. The 25 arrived in early 1971.

Another marketing technique by which Catamore claimed it was victimized was "lock-in." The firm said it was told to convert to a numerical inventory coding system in preparation for the computer.

When delivery was postponed, in part by mutual consent, the firm found the numerical code made parts more difficult to pick and products more difficult to assemble than with the original scheme.

IBM systems engineer Kenneth Racette testified that Catamore lacked any apparent inventory coding system.

Itel Offers DOS/VS to 360 Sites

(Continued from Page 1)

VS; and supports Rotational Position Sensing (RPS) on Itel's 3330-equivalent disk equipment.

Release 30 also supports Shared Virtual Area; eight partitions as opposed to five on IBM's DOS/VS; and resident transient routines, according to Itel.

Vsam capabilities are also available, but still have some rough edges, the firm indicated. However, Itel's Release 30 should have less rough edges overall than the original IBM version because of the extra development time, Itel stated.

Users can obtain the DAP Box package by leasing one Itel 3830-equivalent disk controller and four 3330-type drives at $4,500/mo for 36 months.

A minimum tape package with a controller and four 3420-equivalent drives costs $5,500/mo, while 512K of add-on memory for a Model 50 costs $6,500/mo.

At the end of the 36 months, the user owns the peripherals and and can elect to continue with the Itel DOS/VS environment on a separate contract for between $600/mo and $1,200/mo, depending on the term stipulated and the CPU used.

DAP Box package purchase plans are also available. Buying the DAP package provides the user with use of the simulated DOS/VS environment for 36 months. After that point, he can choose to lease it at the $600 to $1,200 monthly rate.

Current users of Itel equipment not running under the firm's DOS/VS environment can also lease it at the same price.

The DAP Box package is available now from the firm at One Embarcadero Center, 94111.

On the Inside This Week

EDITORIAL
Editorial: Participation Needed 6
White Hat, Black Hat: Checkup Time II 7
Taylor Report: Gigo Needs More Than 'Patches' 7

SOFTWARE & SERVICES
Packages' Contents Rank Higher Than Documentation 9
'FS/I' Uses 360/370, 'Cars' Uses PDP-11 10

COMMUNICATIONS
Comments Urged on FCC Equipment Registration Plan ..11
Automatic Meter Reading Tested 13

TERMINAL TRANSACTIONS
DCC Units Aid Advertising Sales, Traffic, Accounting 12
FTS Converter Makes Manual Conversion Unnecessary ...12

SYSTEMS & PERIPHERALS
Output Reports on COM Save Bank $970,000/Year 15
Bell & Howell Enhances 3700 COM Unit 16

MINIWORLD
IBM 1130 Out, Meta-4 In, IBM 1403-2 In 17
Mini Helps Consultants Analyze Engineering Problems ...18

COMPUTER INDUSTRY
Study Sees '79 DP Shipments Reaching $18.9 Billion 20
Honeywell Projects Its Mini Business Up 58% Over '74 ...21
Data 100 Plans OEM Mini Sales With Acquisitions' Help ..22

FINANCIAL
GA Head Calls Quarter 'Turnaround Point' 30
Ampex Earnings for Year Double 30

Software Extensions Boost S/32 in 370-Based Nets

(Continued from Page 1)

370 are expected a year later, in November 1976.

The DFU enhancements for inquiry and report writing include support for retrieval of data from a secondary file and the selection of records based on the contents of designated data fields.

The user will have more flexibility in reports produced by DFU, since three lines of print – instead of the present one – can be generated for each record selected, five fields – instead of three – can be used as sort keys and five levels of subtotals – instead of three – can be accumulated and printed.

The System/32 SNA/SDLC batch workstation system utility program is being enhanced to appear as an IBM 3770 data communications system transmitting batch data between a System/32 and a 370 operating under either CICS/VS or IMS/VS.

This utility supports batch data input from the System/32 disk storage, and control statements can be entered through the system keyboard or from disk.

In the same vein, output received by the System/32 can be printed immediately or stored on disk for later production.

The batch workstation utility will be distributed free as a component of the System/32 System Control Program (SCP).

MRJE/WS supports submission of RJE jobs to a central 370 and runs under control of SCP over a point-to-point line via the Binary Synchronous Communications Adapter, GSD said.

The full multileaving supported by this program permits concurrent System/32 I/O input and output operations.

The MRJE/WS logic will be distributed as a component of SCP in May 1976, he added.

System/32 Gets Assembler

ANN ARBOR, Mich. – Experienced programmers can work at the instruction level on the IBM System/32 with an assembler now available from Apodictics, Inc.

Subroutines written in Assembly language are cataloged and can be executed directly from any RPG-II program using the EXIT and RLABL operations.

The mnemonics available to the programmer correspond to the basic operation codes implemented in the System/32 control storage. The System/32 manual, "Functions Reference Manual" (GA21-9176), describes the specific operations allowed.

There is a one-time license fee of $300 for the assembler, which can be ordered from Apodictics at 321 S. Main St., 48106.

Ware Wants Action, Not Stands on Privacy

(Continued from Page 1)

this year's Data Processing Management Association (DPMA) Computer Science Man-of-the-Year, will be recognized for his efforts in the area of major national issues, especially as they relate to individual privacy, at the association's annual conference, Info/Expo, in Atlanta this week.

He has worked on security of computer systems for the past 10 years and feels it was natural for him to turn his interests to privacy. This area is continually growing in importance, he said, because of the various things surfacing in Washington, the fair-credit reporting acts and growing concern over the uses of mailing lists.

"My feeling is that privacy is a well-established social issue, and it is not appropriate to take a position against it. What's needed now is support from the industry – ideas about how to deal with the problem," Ware said.

"The industry's job is to provide a critical critique of legislative proposals. DP personnel should be one part of a dialogue on the issue.

Ware said he sees a federal privacy law addressing the private sector in two to four years or possibly sooner, but questioned whether it is necessary to rush into forming such legislation.

"No one knows whether there is abuse of information by private industry but, because of the large amounts it uses, there is bound to be some. However, the level of abuse may be so small that it isn't worth worrying about," he said. "That's why I feel we can afford to move slowly."

Bitzer: CAI Changing Concept of Education

(Continued from Page 1)

society has done to him; CAI can guarantee a functional level of literacy to this student," he said.

A possible problem with CAI, he admitted, is that the resource may spread the gap between the bright and the average student if not made available to everyone. However, if its availability becomes widespread, "it will work to raise the learning levels of all students. Different students can work at different levels, and bright ones can go much farther than they ever could before," he said.

The current drawback to CAI is its high price, but Bitzer said "price is not an insurmountable problem; it's a marketing problem." As systems are mass-produced, their prices will come down to the level of a TV set, he added.

"It's clear that, once this problem is solved, demand will go way up," Bitzer said. Plato is already filled to capacity with a long waiting list, he explained, and the recession didn't hurt the demand.

"We had hoped to get some terminals back" from users who could no longer afford them in order to give them other customers who wanted them, but none came back, he noted.

There have been no complaints from users of Plato; rather, Bitzer said, "our biggest boosters are teachers and students. There has been no lessening of demand; instead, it increases exponentially."

INTRODUCING

Automated System Charter.

The Automated System Charter (ASC) provides a panorama of job flow from JCL or simple System Chart Language (SCL) input. Generates system charts and reports. Contributes to all stages of an application's active life. Helps establish an effective communications network among everyone involved in, or affected by, every data processing application.

Extended Control for Management. By making available, in immediately useful form, all pertinent information concerning an applications system.

Comprehensive Training Program for Computer Operations. ASC graphic outputs provide a comprehensive, accurate, and understandable overview of a system's operation.

Effective Guidelines for Production Control. ASC provides critical information to direct and monitor job and data scheduling.

Direct Participation for End Users. ASC offers for the first time a medium for successful communication between an end user, regardless of his EDP sophistication, and those most closely involved in filling his needs.

Improved Communication Resources for Systems Analysts. ASC documents user needs, system specifications, and design progress. ASC assures accurate and up-to-date documentation.

Increased Productivity for Programmers. ASC offers complete and reliable design documentation to guide program implementation. ASC produces diagnostic and analytical charts and reports to assist programmers in coding, testing, and debugging.

ASC produces:

- **System Charts** — Diagram the relationship of jobs, processes, and data.
- **System Reports** — Present the same information in tabular form.
- **Job Reports** — Index of jobs and their processes.
- **Process Reports** — Index programs and their related data elements.
- **Data Reports** — Directory of all data elements which interact with the system.
- **System Logic Charts** — Diagram the processes of a system in terms of the decision logic which determines whether each process will be executed.

ASC, as a primary system communications tool, has been developed with overall user convenience in mind. Consequently, each ASC output reflects a clearly defined use, and the entire superset of ASC documentation offers a system overview that is comprehensive, accurate and timely.

For more information about ASC, ADR's newest AUTOFLOW® II option, send the coupon, or contact any ADR office.

APPLIED DATA RESEARCH, INC.

Software Products Division
Route 206 Center, Princeton, New Jersey 08540
Telephone: (609) 924-9100

☐ Please send information on ASC

Name Title

Company

Address

City State Zip

Telephone

Computer Configuration

I am also interested in:
☐ AUTOFLOW® II for maintenance & debugging
☐ The LIBRARIAN® for security & protection
☐ ROSCOE™ for on line program development
☐ MetaCOBOL® for increased productivity
☐ SAM™ for planning through simulation
☐ PI SORT 2™ for faster sorting

APPLIED DATA RESEARCH THE SOFTWARE BUILDERS®

ADR software products: in use at over 4,500 installations worldwide.

U.S. offices in Boston (617) 245-9540, Chicago (312) 775-9855, Cleveland (216) 228-0880, Houston (713) 526-3188, Los Angeles (213) 826-5527, New York (212) 986-4050, Pittsburgh (412) 885-2822, Princeton (609) 924-9100, Washington (703) 281-2011.

Foreign offices in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Norway, Philippines, Puerto Rico, Republic of South Africa, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, West Germany.

IBM Reprimanded for Violating Antitrust 'Gag Rule'

(Continued from Page 1)

that, in the future, IBM submit all such statements for clearance to him before they are issued.

Barr claimed the article had only gone to IBM employees and to stockholders at the annual meeting, neglecting that the piece has also been sent to members of the press.

The court pointed out "the government also has stockholders. [Its] clients are the people of the United States," to which Barr replied "the government has no stockholders of any kind that are in a different – they have no people who are more interested because they are the government than we do because we are IBM.

"We have every right to communicate with all of these people today but the stockholders of IBM stand on a different footing, I think, than a general citizen of the country because it is their future that is being decided in this case."

Rather than let the judge censor IBM's communications with stockholders, Barr asked that the order barring the firm and the government from outside communication be lifted.

Noting that he would like to avoid that course, Edelstein mused that he could lift the order and let the parties "go ahead and blast yourselves silly, if you like; get into a competitive race of who can saturate the tube more, who can speak to more reporters, who can issue more press releases."

However, he told Barr that "this order was invoked at your request for your benefit. Now what has changed?

"Is it because you liked it then and it served a useful and pragmatic purpose and now that you accomplished the result, you no longer like it because you would like to do something else?"

Barr indicated he did not like to put the court in the role of censor. Edelstein replied, "But you had no difficulty anticipating that, you balanced the convenience, you knew what the strictures were at the time you insisted upon having this order; the fallout was greater for you than not."

Speaking for the government, Carlson said some of the attorneys general who have been in office since the order was handed down – "How many, 6,000 since the order has been in effect?" he quipped – have felt it unfair, but they have observed it by clearing any material for distribution with the court.

Since it has been in effect for so long, continuing it does serve a useful purpose, he indicated.

The judge said he would consider the IBM motion to lift the so-called gag rule, but until he makes a decision he repeatedly ordered the IBM attorneys to instruct the firm's executives to obey the order and not comment on the case in public.

Davis Urges Positive Approach To Technological Sensationalism

(Continued from Page 1)

privacy rights are not violated. Controls on access to network resources must be established and maintained as safeguards against misuse."

Once assured that network resources are accessed in a controlled manner, it is essential that those who need and have the right to access specific resources be able to identify and access them simply and readily.

"Although standardization of network protocols seems slow in coming, there is an alternative solution to this problem. This is a user-oriented interface to networks in software, hardware or a combination of the two which translates simple user commands into complete network protocols," Davis said.

"We need user-oriented standards for terminals as well as other network protocols so the problems of access do not snowball as networks are interconnected," she added.

The control of network access, simplification of user access and performance evaluation are all under study at NBS and guidelines are being prepared for use by federal agencies, she said.

Two Sites Evaluating Amdahl Corp. 470 CPU

(Continued from Page 1)

The assortment includes IBM 3330-equivalent disks from Itel, Storage Technology Corp. tapes, a Memorex 1270 communications controller and a home-built front-end processor.

The 470/V6 will run under the Michigan Terminal System, a virtual operating system which the computing center originally designed for an IBM 360/67.

Its workload will include handling a large number of terminals used for instruction and research, with about 60% of the terminals conversational and 40% batch units, Bartels said.

In April, the peak month, this workload comes to about 120,000 jobs, he added.

The Amdahl machine is price-competitive with IBM's 370/168, Bartels remarked. As far as future maintenance and stability of the vendor is concerned, "we have, I think, confidence in that company," both in terms of its engineering and the support the firm has from both domestic and foreign sources.

An Amdahl machine was also said to be slated for testing at a Singer Co. site in New Jersey, but a Singer corporate spokesman denied any knowledge of it.

Lockheed System III

The only multi-terminal small business computer you won't outgrow every time you grow.

Introducing the Lockheed System III, now with new multi-terminal capability. That's good news whether you plan to use a small computer system or plan to sell them.

System III is designed to grow with you. You can buy what you need now; expand systems when you want. With the new multi-terminal System III models, you can connect up to eight auxiliary terminals, both local and remote. That means nine people can be using the computer simultaneously. With this capability, System III is the most cost effective business computer you can buy.

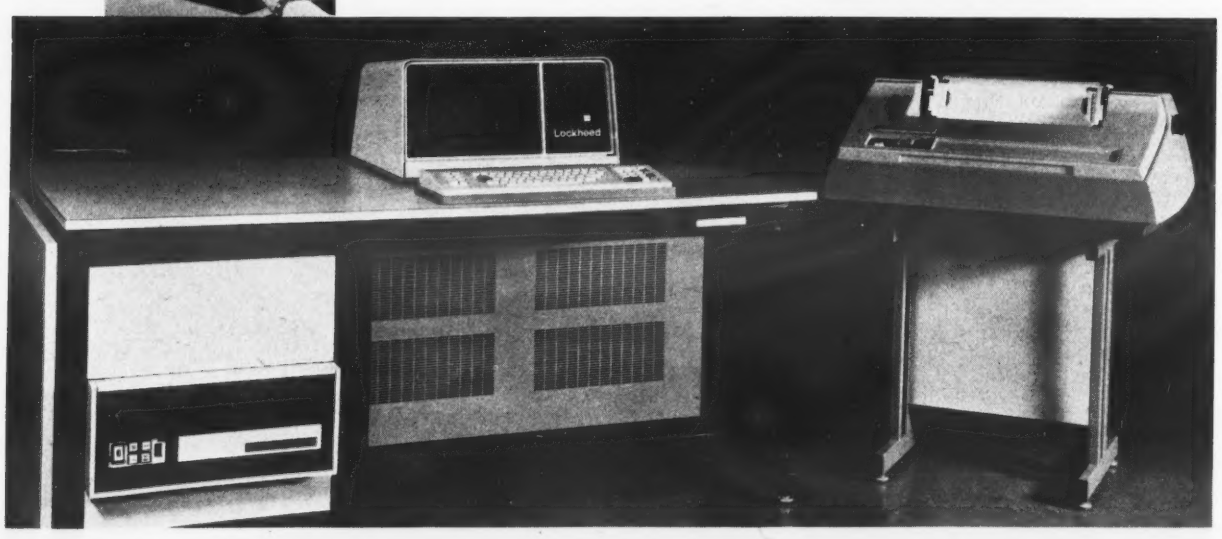
Interactive capability includes data inquiry/entry and on-line file updating. Each terminal features multi-function foreground operation. And what could be better for inventory control and order entry applications, while your batch processing continues in the background.

Plus you've got a system supported by industry compatible RPG II software, as well as assembly language and FORTRAN. System III also includes File Management, Sort/Merge, operator utilities and editors, all under the control of the Disk Operating System. It can be expanded to 64K bytes, four disk drives providing 20 million bytes on-line, up to 600 LPM printer, and six models of 80 and 96 column card devices.

So if you're interested in a small business computer that can be eight times more useful to you, let's talk. If you want information about using the Lockheed System III, call our nearest office. If you'd like to become a System III dealer, call collect, (213) 722-6810. Or write 6201 East Randolph Street, Los Angeles, CA 90040.

Atlanta 266-0730 • Boston 861-1880 • Chicago 833-4600 • Dallas 357-9496 • Detroit 557-5037 • Los Angeles (213) 921-2115 • New York metro (215) 542-7740 • Philadelphia 542-7740 • San Francisco (408) 257-3357 • Washington (703) 525-3600 • Distributed in Canada by MICR Systems, Toronto 487-2841, Montreal 931-2451 • ACT Computer, Victoria 385-8765, Vancouver 688-0722 • LSE, Brussels, Belgium 219.29.00.

Lockheed Electronics
Data Products Division



WE INVENTORY
DEC • HIS • UNIVAC • IBM
And over 70 Brands
In our 42,000 Sq Ft
Electronics Facility
AMERICAN USED COMPUTER CORP.
(617) 261-1100
P.O. Box 68, Kenmore Sta.
Boston, Ma. 02215
Member Comp. Dealers Assoc.

+M*

In the computer peripheral and leasing business, one symbol is worth thousands . . .

. . . of Dollars of annual savings. PLUS-M is the symbol for CIG's complete line of Add-On-Memories, totally plug-compatible with IBM mainframe computer systems. Since 1970, CIG has been marketing Add-On-Memory systems with not only the latest state of the art electronics, but the latest means of financing them — to stretch your EDP dollars to yield considerable annual savings.

Take the newest addition to the PLUS-M family — the CIG/158 PLUS Add-On-Memory. We believe our /158 PLUS is the first really viable Add-On-Memory unit for the 370/158 since it incorporates a 4K chip instead of a 1K memory element. And that means tremendous power savings and 75% fewer memory chips — so there's less to go wrong. For example, if you were to upgrade from a Model K to a Model L, your power consumption would increase by 1.5 KVA with IBM memory. The same upgrade with a CIG/158 PLUS would only add .5 KVA.

Add up these important design features of our new CIG/158 PLUS:
Plus Attached gate design.
Plus Expansion up to 8K bytes.
Plus Reconfiguration capability.
Plus Single Bit Error latching.
Plus Standard IBM IMPL and diagnostics and PLUS CIG diagnostics for an even easier operation and maintenance.

All this adds up to the fact that the CIG/158 PLUS is the Add-On-Memory unit your system is ready for if additional main memory capacity is required. PLUS-M is the symbol to look for if your 370/158 memory requires expansion, but your budget does not.

Plus CIG maintains a comprehensive Technical Services Center to provide highly sophisticated back-up support for all of our Add-On-Memory units now in service throughout the world.

For additional information on the CIG/158 PLUS and the complete line of money-saving CIG products, please fill out and mail the attached coupon — which can mean **Plus-$avings** for you.

+M

***The CIG/158 Plus Add-On-Memory**

CIG

CIG COMPUTER PRODUCTS, INC.

A Subsidiary of Computer Investors Group, Inc.

1351 Washington Blvd., Stamford, Conn. 06902 (203) 359-2100

Dear CIG,

☐ I'd really like to hear more about your pluses and your prices.
Have your rep call me at _____.
(phone)

I currently have a 370/ _____ with _____K of memory.
Send info on other CIG products: 360/_____, 370/_____,
Package Leasing _____.
NAME_____TITLE _____
COMPANY _____
STREET _____
CITY _____STATE_____ ZIP _____
No. 07027CW

Editorial

Participation Needed

Issues relating to computer systems are increasingly coming under scrutiny by the general media and the public alike, particularly in areas where the use of computer systems impacts the public at large.

Unfortunately the role of computer systems is often ill-defined in the public mind and unintentionally distorted by reporting in the general media.

The general press reports on recent revelations of illegal Army files on civilians and on computerized credit files in New Hampshire are only two instances of misinformed reporting that serves to scare rather than enlighten the general public.

In both cases, the fact computers were used as a tool for either illegal or immoral purposes received more of the attention than did those practices themselves.

The computer, rather than the personnel who controlled and used the tool, became the villain. Attention was diverted from the real criminals – those who used the tool for less-than-laudatory practices.

It should be the responsibility of everyone in the computer community – and particularly the responsibility of computer users – to help set the record straight in such cases.

The reporting – and the attitudes it reflects – is of a poor quality not because reporters and the public purposely want to distort the role of computers.

Rather, the attitude is fostered by a lack of knowledge of computer systems. And what people don't understand, they often regard as mysterious and therefore frightening.

We in the computer community must share a great deal of the blame for this misinformation.

Too often we assume the general public cannot understand the role of computers because it does not understand our somewhat arcane vocabulary.

Too often we talk down to members of the general public and oversell just what our systems can do, leaving the public with a feeling computers can do almost anything.

If we allow the public to continue to be misinformed about computer systems, we may well be faced with stiff and unworkable regulations imposed by that public.

And we will deserve what we get.

But we can overcome these attitudes by some positive action.

For a starter, the members of the computer community should be alert to misreporting concerning computer systems, whether in a local newspaper or on a national television network.

When such errors occur, we should actively try to get them corrected either through letters to the media or visits to the editors and reporters involved.

In doing this, however, everyone should be careful to try to explain the situation in nontechnical, nonjargon language.

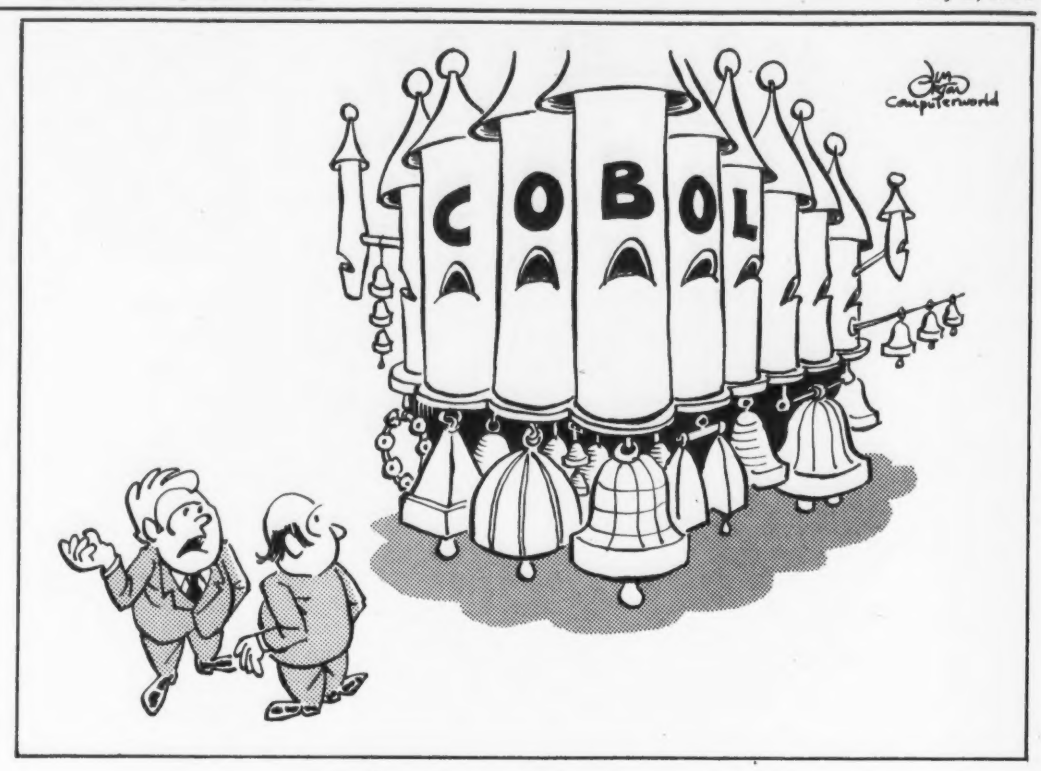
Secondly, our professional societies at both the local and national level should attempt to educate responsible parties – particularly in the media – on the capabilities and attributes of computer systems. Again, no jargon please.

The manufacturers of computer equipment could also do this by running seminars for local and national media. IBM has had such a program for years and some other manufacturers have also tried.

We in the computer press also have a responsibility to help in the education project by working with our colleagues in the more general media to help them understand the technical issues involved in public policy decision on computer systems.

We've all got our work cut out for us.

But the time to begin is now.



'How Many More Can They Hang on It?'

Letters to the Editor

Defense of DP Long Overdue In Cases of 'Computer Errors'

I was delighted to read the commentary [CW, June 4] by Tom Newton concerning the overemphasis of errors in the DP profession.

It was a long-overdue defense of a profession consisting of, in the vast majority of cases, individuals dedicated to excellence in their particular facet of DP.

Being a programmer, I have been both insulted and enraged by numerous news articles subjecting computers and computer people to one lampoon news after another.

One publication I read even went so far as to include a weekly article in which letters concerning "computer foul-ups" were featured. Words at the conclusion of the article encouraged readers to send in accounts of their "run-ins" with computers, saying that if they were amusing or unusual enough they would be published.

While this type of activity may be amusing to some, it is not only insulting to DP professionals, but also further dims the unjustly tarnished image of the computer community in the eyes of John Q. Public.

I encourage all computer professionals to write editorials to publications engaging in this type of irresponsible journalism, expressing their indignation.

It's high time DP received recognition for what it truly is: an integral contributor to the effort to improve the human condition.

Lane E. Taylor

Albemarle, N.C.

Cobol Features Unappreciated

In the article, "Does Cobol's Report Writer Really Miss the Mark?" [CW, June 18], William B. Simmons asked a question I have also been wondering about for some time.

Of course, the Ansi Cobol Report Writer is not "as bad as everyone makes it out to be." Moreover, there are many reasons for the seemingly pervasive ignorance concerning this valuable, yet maligned, tool.

Quite often, programmers are not permitted the luxury of reading their manuals on company time. Some managers frown upon this sort of nonproductive time. In addition, the manuals which describe the Report Writer are reference publications – they were not designed for teaching purposes.

In other words, if an installation does not encourage education, there is little wonder that "most programmers don't know enough about Report Writer to maintain it properly."

There are other Ansi Cobol features which are underutilized – the internal sort, relative indexing, table/array handling and implied connectives. All of these aids, when properly utilized, help to make Cobol a more powerful language.

Management can help correct the situation by allotting more time for education and the development of standards (including the requirement of the Report Writer for all batch environment applications). Educators can help by selecting and writing more practical textbooks.

William J. Beaver

Oakland, Calif.

Sticking to 'Tried and True'

I would like to add to William B. Simmons' list of reasons programmers don't use the Cobol Report Writer Module.

I don't use the Report Writer for the same reason I don't use the SEARCH verb. I simply don't trust the Cobol compiler supplied by my friendly hardware vendor.

I might try the SEARCH verb again to see if the problems have been fixed in the current release of the compiler. If the SEARCH statement doesn't work, I can replace it easily with a PERFORM statement and an IF test.

But I don't think I'll ever try the Report Writer, because replacing its use with conventional code would require a considerable amount of time and effort.

Maybe there will come a day when my confidence in vendor-supplied software will have increased enough to consider the risk of trying new features negligible.

Until then, I have a job to do that can best be done by sticking with the tried and true.

J. Stevens Blanchard

Torrance, Calif.

ACM Decision Based on Reason

Herb Grosch would be a much better columnist if his irrational biases were not getting in the way. His account of the Association for Computing Machinery (ACM) Council position concerning the artificial intelligence conference in the Soviet Union [CW, June 11] was ludicrous.

Many of us felt an ACM special interest group would not be an appropriate agent for disbursing conference travel funds, and we voted on that basis.

The fact the conference was to be held in the Soviet Union had nothing to do with it, and venality (which, I would remind Grosch is not confined to academics) was not the issue. As to Grosch's "screams of anguish" before the council, they were counterproductive and can't substitute for sound reasoning.

Gerard Salton

Ithaca, N.Y.

(Other letters on Pages 7 and 8.)

Letters to the Editor

Glaser, Acpa Express Complementary Views

I was pleased and very interested to read statements on licensing from both George Glaser and the Association of Computer Programmers and Analysts (Acpa) in your June 4 issue.

The juxtaposition of the two statements is (I assume) something of a happy accident in that they were quite opposite, but really very complementary.

The Acpa made a truly absurdist commentary on the current DP licensing proposals.

While Acpa has indeed grossly exaggerated the situation, its "licensing program" is certainly the same basic program other, more staid organizations have been pushing.

Glaser is concerned with the DPer as a human being, and the human being as a professional. He feels there is a distinction between a competent workman and a professional. He appears to feel that, while one might certify (if not license) skill, it would be an entirely different and more difficult task to certify, let alone legislate, professionalism.

These two opposites express my own views rather well. First, Glaser's point that one cannot legislate a mental attitude is exemplified by the legislators themselves. Any attempt at such legislation could indeed only be oppressive.

Acpa's point is that it is totally impractical to license competence in the computer field, simply because the computer field is so large and amorphous.

There can be no inclusive definition of the field, when one can start at an IBM 370/195 at the high end and work down to a programmable calculator on the low end.

At very best, licensing could demand a person have skills in one particular area of DP and be allowed to practice his profession in that area only so long as no malfeasance on his part were detected. The usefulness of licensing for the "fringes" of the industry would be nil.

In my own case, on a minicomputer working in real-time medical information systems, I would have absolutely no use for a "professional" licensed to practice in a normal big-machine commercial DP environment. Worse than useless, such a person would probably be dangerous.

Add to this the fact the "traditional" application areas are being dissipated into all varieties of "alternative" solutions (which are still, however, "data processing"), and you have a mess at best if licensing is required.

On the other hand, simple certification would be a distinct step in the right direction. Assuming one had a system of varied certification areas, a person who had been properly and voluntarily certified in a particular application area would be a valuable property and would have increased his worth considerably over one whose competence was not certified.

L.F. Wygant
Chicago, Ill.

Checkup Time II

For 1974, I predicted the disappearance of Siemens and Control Data, with the latter carrying the footnote, "postponed to 1976 if Nixon is reelected." Now, Ugly Dick was indeed reelected, but it didn't stick! And, in 1974, Bill Norris began a series of security-analyst talks and a line of advertising that explicitly converted CDC to a computing *services* company: Cybernet, the service bureau Frankenstein monster, and so on. Also Seymour Cray, Hero of Livermore, and Jim Thornton, abashed Father of Star, left the company. Yes, I can claim Control Data disappeared precisely on (the original) schedule!

Didn't do so well on Siemens, however, which as of this writing is still struggling. With the Telefunken losses, about $30 million in 1973, its own losses, about $75 million in the same year, and an extrapolation of government support for R&D based on the 1971-73 triennium figures, I'd estimate Siemens' annual losses *before* the Bonn subvention to be over $200 million this year, and still rising. Looking at the GE decision in the United States, I simply cannot see it holding out much beyond 1975. Nevertheless, I'm clearly not as accurate on Siemens as on CDC.

I thought 1975 would be the big collapse year, based more on sales trends and on expected collection on intelligence about IBM intentions than on any anticipation of the world economic picture as it is today. Remember, 1971 was stories-about-FS time, boom-around-the-world time, pre-Arab time! I predicted the disappearance of Burroughs, Compagnie Internationale d'Informatique (CII), Nixdorf "unless they give up current challenges to IBM and withdraw to minis and bookeeping machines" and International Computers Ltd. (ICL), the largest European competition of IBM. I had originally said 1974 for ICL, but in the first six months of 1972 had revised the year upward to 1976 when Tom Hudson was brought in as chairman, and back to 1975 when he in turn hired Cross as managing director.

ICL was known in 1971-72 to have an advanced development (the New Range, or NR) ready to announce. It finally brought it out, and the sexy 2903 especially is being pretty well received. But horrid financial losses, major dependence on Whitehall support and galloping indigestion from the several-layer merger of six or more incompatible original companies, their systems philosophies and architectures and their people continues to depress us observers. I wish it well, would like to see it stand off IBM in the UK. But I expect it to crumble the moment British government support – preferential procurement, research grants and indirect help – is withdrawn. If not 1975, that has to be soon, say 1976.

Nixdorf did indeed very clearly pull back from a projected entry into the medium-machine and number-cruncher businesses, and survives nicely. It has recently felt euphoric enough to mount a small challenge in Tokyo. Good!

I was just plain wrong about Burroughs. The Secret Computer Company, the one with the great technology and the invisible sales effort, is doing fine – better in 1975 than in 1971, not only absolutely but relative to ever-growing IBM. Mind you, I don't believe it is nearly as profitable in the mainframe business as in the small stuff – still, it is definitely viable and will, I now believe, survive at least four years beyond my Munich prediction.

Herb Grosch

Preventing Gigo Requires More Than Just 'Patches'

The Taylor Report
By
Alan Taylor, CDP

Recently in this column [CW, June 18] we discussed a very simple case of "garbage in, garbage out" (Gigo) – the entry of "2 lb 30 ozs" into the computation of a supermarket's unit-price labeling system, with the resultant output of a wrong unit price for a 2 lb 3 oz packet. This showed Gigo in a very pure form and also illustrated the existence of error-prone situations in information systems, which can be allowed for in design in the same way hardware engineers allow for "hot spots."

In the supermarket Gigo case, the hot spot is the simple fact the word "ounce" begins with the ambiguous symbol "O," in conjunction with the patterning of a human brain which simply will not read "2 lb 3OZ" as being "2 lb 30 Z."

Since neither the word "ounce," nor the human interpretation capability which rejects "2 lb 30 Z" will go away, information systems dealing with such input have a permanent hot spot.

The first impulse would be to add a check into the output program to stop such possibilities. To check for any ounce figure greater than 16 could well be described as "making it impossible for this type of error to ever reoccur."

Such a check would certainly have caught the 2 lb 30 oz Gigo situation. It would also catch other similar ones, such as 4 lb 40 oz, 4 lb 50 oz, etc.

But what about the error possibility of 1 lb 1 oz being output as 1 lb 10 oz? That would slip right through the check without it being noticed.

When a check catches 14 of the possible 15 error conditions, it can be evaluated as handling 93% of the errors – which doesn't sound bad, does it? It sounds like a really well done job, doesn't it?

Evaluating Errors

Well, I don't think so for two reasons.

- The 93% computation is based upon the erroneous concept errors can be evaluated by counting noses.
- The approach suggests error reduction is professionally proper prior to knowing whether error elimination is possible.

In the case of the supermarket Gigo incident, the difference between the correct unit price based on 2 lb 3 oz and the printed unit price based on 2 lb 30 oz was substantial.

However, it is data-dependent and the difference varies with the actual error situation.

In this case, the ratio of this difference was 27/56. But, if the number of pounds had been higher, the difference would have decreased. If the number of ounces had been higher, the ratio would have been increased. If the number of pounds had been lower, the difference would have increased, while if the number of ounces had been lower it would have decreased.

The difference itself between the correct and the incorrect price ratio is important because the more the difference is, the less likely a person reading it is to rely upon it.

For instance, a 1 lb 10 oz carton that gets marked as 1 lb 100 oz – and computed at a unit price that is more than four times out will raise questions the moment anyone starts doing some serious comparison.

By contrast, the smaller the error is, the less likely it is to be spotted by the user. The 1 lb 1 oz carton treated as 1 lb 10 oz has an error ratio of 9/26, the 2 lb 1 oz treated as 2 lb 10 oz has an error of only 9/42, etc.

Noticeably, the items with the lb 10 oz Gigo are the least likely to be noted when unit pricing is in normal use, and this is the one out of 15 possibilities the over-16 check misses.

Any evaluation of the effectiveness of an error system which fails to note the importance of the 1 lb 10 oz problem is just an amateur patch – not a system approach.

System or Patch

Which brings us to the second point as to why the over-16 error-reduction approach is not the only way to go about the problem of handling information system Gigo hot spots. As an alternative, actual system design to eliminate the Gigo problem can be undertaken.

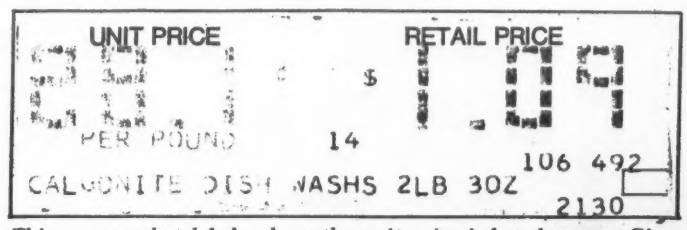
There are a number of ways of doing this, but here is an analysis leading up to one:

- The problem exists when the "O" of "Oz" is entered as a numeric.
- The problem cannot exist, therefore, when the "O" of "Oz" is entered as an alphabetic.
- The problem can be eliminated by checking prior to output that the "O" of oz is an alphabetic.

True, like most solutions, it didn't confine itself to the area where the problem results occur, but went elsewhere. In this case, it went to the cause. Then, it handled the cause – not the result – systematically.

The cost of handling Gigo error situations in this systematic way is no higher – and in fact is often lower – than handling them in the amateur, cosmetic manner. So, shouldn't we aim to come up with systematic approaches to eliminating the errors, rather than with the patch approaches which are often thought to be sufficient?

© Copyright 1975 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of *Computerworld*.



This supermarket label, where the unit price is based upon a Gigo input error, is used as an illustration of correct and incorrect approaches to handling permanent error-prone spots in information systems.

Have a June ceremony.

Marry data communications to data base.

Combining database and data communications is a lot like getting married. Compatibility is a *must*.

The vital nature of data integrity, restart/recovery, resource utilization, reliability and performance, in the data base/data communication environment demand a very close marriage.

That's why Cincom believes it is important to you for us to provide compatible solutions to both your data base and your data communications requirements.

TOTAL — the data base management system
ENVIRON/1 — the data communications control system

In this "marriage" all partners gain in the relationship. TOTAL is better because of ENVIRON/1; ENVIRON/1 is better because of TOTAL. And your data base/data communication union is a successful one because of the continuing support of the Cincom organization . . . now serving over 875 clients.

If you are interested in the ideal database/data communication marriage, in which the products were made for each other, why not give us a "ring"?

ENVIRON/1
Brings batch programming Ease to the World of On-Line Processing

ENVIRON/1
Cincom Systems, Inc: We create efficiency.

24 offices in major U.S. cities & worldwide
2300 Montana Avenue/Cincinnati, Ohio 45211/(513) 662-2300

Letters To the Editor

'Think' Says It All For DPers in Every Phase

Upon reading the letters to the editor in the May 21 issue of *Computerworld*, I was particularly attracted to the "DP a Science, Not an Art" article by Hugh A. Bursi.

In all honesty, I am not a proponent of artistic and/or scientific programming techniques. What I am in favor of is sound data manipulation, data security and quality report-writing functions, i.e., management tools meaningful to people other than Harvard professors.

These means do not necessarily demand an artistic or scientific person, only a logical one.

IBM created a desk plaque some years back and one of which I am still a proud owner. This plaque simply stated the word "Think."

If there is a DPer in any phase who can defeat this logic, he or she has invented the ultimate "better mouse trap."

In response to Bursi's statement "Art defies logic and science creates it," I can only say if this were true, Whistler's mother would have fallen out of the rocking chair and Isaac Newton would have had to climb the tree and throw the apple to the ground.

Ed Powell
Bloomington, Ill.

Sticking With Old Ideas

Human experience makes it difficult to discard old ideas. A good example is Glen Watkin's response [CW, May 28] to comments attributed to me [April 16].

The choice of Basic over RPG is not germain, nor, in fact, is any "improved" compiler. The point is that the System/32 Industrial Application Programs *eliminate* compilers and programming.

David E. Ferguson
Publisher
System/3 World
Los Angeles, Calif.

How to Protect Idea?

I am looking for advice on how to protect a software and/or application processing concept prior to the time that it is up and running.

I expect to develop it through a grant and it will, of necessity, be revealed to such a degree (in order to obtain the grant) that it could be picked up by others and developed by them.

Reference to material on this subject would be greatly appreciated.

Robert F. Boyd
1729 Laird Avenue
Salt Lake City, Utah 84108

IDOS/VS
A Conversational, Time-Sharing DOS/VS System

- Text Editor Facility for creation and maintenance of DOS/VS programs and data files online
- Execute and debug DOS/VS programs online
- Supports DOS/VS compilers, utilities and program products...supports ISAM, VSAM and other file access methods
- Extends the CMS (Conversational Monitor System) environment of VM/370
- SYMBUG (Symbolic Debugging for COBOL, FORTRAN and ASSEMBLER programs) and SYMDATA (Test Data Generator) available under IDOS/VS

STANDARD DATA
Since 1959

STANDARD DATA CORPORATION
1540 Broadway, New York, N.Y. 10036 212/586-3100

Software 'Superior by Design'

STANDARD DATA CORPORATION
1540 Broadway New York, N.Y. 10036

I'm interested in receiving:
☐ Information about IDOS/VS
☐ VM/370 Software Products

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

Dear Computerworld:

I (borrowed) (stole) (shared) (copied) this issue of *Computerworld*, and it made me:

- ☐ PROUD
- ☐ SKEPTICAL
- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED

☐ ALL OF THE ABOVE

☐ PLEASE ENTER MY SUBSCRIPTION (details on back)

Place Mailing Label Here

☐ **I'm already a subscriber, but I'd like you to change my:**

- ☐ **address**
- ☐ **title**
- ☐ **industry**
- ☐ **other**

My current mailing label is attached and I've filled in new information on the other side.

Note:
Please fill out form on back, detach and insert in post-paid envelope attached through binding.
Thank you.

COMPUTERWORLD

Please send me COMPUTERWORLD for 1 year. RATES: U.S. - $12 Canada and PUAS - $20 Other foreign - $36

☐ Check Enclosed
☐ Charge My American Express Account

If charge we must have cardholder's signature:

First Initial		Middle Initial	Surname	
Your Title				
Company Name				
Send to: Address				
City		State	Zip Code	

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

COMPUTERWORLD
CIRCULATION DEPT. 797 Washington Street, Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

PLEASE CIRCLE YOUR PRIMARY BUSINESS

10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/ Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/ Other Communication Service
95 Other: _____

PLEASE CIRCLE YOUR OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: _____

Detach here, fold, and place in post-paid envelope attached through binding.

In Survey of French Users:

Packages' Contents Rank Higher Than Documentation

By Toni Wiseman
Of the CW Staff

PARIS – Software package users here are more satisfied with the intrinsic quality of the products than with the services promised by the vendors and distributors, according to a recent survey by *Zero-Un Informatique*, a French publication for the DP industry.

The most severe criticism of purchased packages was in the area of documentation and formatting.

Users were asked to rate both European and U.S. packages on eight criteria: reliability, quality of technical support and maintenance, quality of vendor-supplied documentation, quality of vendor-supplied formatting, acceptance by users, conformity to vendor specifications, conformity to vendor performance claims (execution time, memory allocation needs) and general degree of satisfaction.

The ratings were based on a scale of 1 to 4, with 4 meaning excellent; 3, good; 2, acceptable; and 1, poor.

The survey focused primarily on 20 packages which six or more sites reported using. A secondary list showed averages for packages with fewer users, however, and a total of 65 packages were included in the results, which ran in *Zero-Un*'s June 9 issue.

The average for all packages were tallied at 3.27 for reliability, 2.85 for maintenance, 2.69 for documentation and 2.51 for formatting. User acceptance rated an average grade of 3.02; conformity to specification, 3.17; performance, 2.9; and general satisfaction, 3.09.

Distinguish Characteristics

Zero-Un noted the importance of distinguishing between ratings related to intrinsic qualities of a package (reliability, conformity to specs, performance) and those which are attributable strictly to the quality of the service provided by the vendor (maintenance, documentation, formatting).

For example, the report said, a package such as Software Design, Inc.'s Grasp, which has been a "star" of the international software market since its announcement, fell in the good-to-excellent area in terms of intrinsic qualities, but rated barely acceptable in terms of the service provided by the French distributor.

The results should also be considered in light of the fact that the questions favored "small" products with sharply defined functions to the detriment of more ambitious packages. Thus, utilities fared better in the ratings than program generators or data base packages which have greater reliability, maintenance and documentation problems.

Applied Data Research's Librarian was the most widely reviewed of the U.S. packages, with 45 responses, and had consistently high ratings ranging from 3.78 for reliability to 3.53 for general acceptance.

DOS Dump/Restore developed by Westinghouse, however, had the highest reliability rating, 3.95, of any package, European- or U.S.-supplied. It was also ranked highest for general satisfaction.

IBM ratings were tabulated separately. Results indicated that, while the Customer Information Control System (CICS) is the mostly widely used IBM package, its ratings across the board were only average.

DOS Ditto, with high marks of 3.86 for reliability and 3.14 for general satisfaction, topped the ratings for IBM packages.

Package	Reliability	Quality: Maintenance	Quality: Documentation	Quality: Formatting	User Acceptance	Spec. Conformity	Performance	General Satisfaction	U.S. Vendors
Autoflow	3.5	3.4	2.5	2.4	2.17	3.0	2.33	2.5	Applied Data Research
CA-Sort	3.74	3.13	2.84	2.67	3.53	3.33	3.47	3.42	Pansophic Systems
DOS Dump/ Restore	3.95	3.40	3.0	2.58	3.64	3.77	3.68	3.64	Westinghouse
Fast Dump/ Restore	3.83	3.0	3.0	2.5	3.66	3.33	3.5	3.5	Innovation Data Processing
Grasp	3.38	2.38	2.25	2.13	3.13	3.38	3.38	3.0	Software Design
Librarian	3.79	3.27	3.07	2.86	3.24	3.58	3.31	3.53	Applied Data Research
Mark IV	3.36	3.0	2.73	2.6	2.0	2.73	2.18	2.55	Informatics
Panvalet	3.56	2.22	3.0	2.44	3.33	3.33	3.44	3.22	Pansophic
Quikjob	3.2	2.7	2.5	2.29	3.9	3.6	3.5	3.5	Systems Support Software, Inc.
SMS	3.2	2.89	2.44	2.3	2.8	2.9	2.89	2.7	Boole & Babbage

'Roscoe 3.0' Enhances Remote Support

PRINCETON, N.J. – Modifications built into Version 3.0 of Roscoe, the conversational programming system from Applied Data Research, Inc. (ADR), provide better performance and reduced overhead to IBM OS and OS/VS users, according to a vendor spokesman.

Roscoe supports remote data entry and editing, library storage of data and syntax checking of programs submitted for compilation.

It also manages job submission and output retrieval, programmed prompting and jobstream generation and monitors services, including loading and execution of programs under control of a command entered at a terminal.

Routines Reentrant

Most of the routines in the new version are reentrant, which will reduce the amount of paging required in a VS environment "by at least 50%." Beyond that, less core will be required in any environment and "savings of at least 10% to 15% can be anticipated" from this change, ADR claimed.

Terminal support and other variables may be changed as required from run to run since the Version 3.0 software is reconfigurable at runtime. The old version had a fixed configuration set at assembly time, the vendor noted.

Partitioned Sets Replaced

The use of partitioned data sets for the Roscoe library has been replaced by a Bdam organization which features system programmer utilities for maintenance and reporting on the libraries.

Other Advantages

Greater compression of data, immediate reuse of space released by deletions, faster access to any given user data set and direct positioning at any line number of a user data set are other advantages of the new library scheme, ADR said.

On the operational level, messages to the console or terminal are numbered and marked with a code to show which require operator action, which are error messages and which are purely informational.

The old use of a pending reply may be optionally replaced by use of the OS STOP and MODIFY commands for communicating with Roscoe, the spokesman continued.

Support for releases of Roscoe that predate Version 3.0 will be discontinued at the end of the third quarter of this year, the company has announced.

Roscoe 3.0 is available now for $23,500 under perpetual license or $1,300/mo. ADR is at the Route 206 Center, 08540.

Macros Ease User Linkage With Adabas

RESTON, Va. – Application programmers can gain easier access to the Adabas data base management system (DBMS) with the introduction of the Adabas Macro Interface (Adamint) by Software AG.

With the availability of Adamint, users working in Cobol, PL/I, Fortran, Assembler or any other language with standard call linkage can work directly with data managed by Adabas.

The Adamint call interface is described by Software AG as "equivalent to the Codasyl Cobol data manipulation language."

Adamint provides a module for each user view of the data base, which permits the user to access and manipulate the pertinent subset of that base with concern only for selection criteria and I/O areas, the vendor explained.

Prior to the development of Adamint, users had to work with a low-level direct interface to Adabas, creating coding that had little or nothing to do with the logic of the application itself, Software AG admitted.

With Adamint, the user communicates his requirements for data and its manipulation to the installation's data base administrator (DBA). The DBA specifies appropriate parameters for the Adamint macros, which are then assembled into a custom Adamint load module for that particular user.

The DBA also provides the user with a set of entry-point names which the user then calls from a program to manage all the necessary interaction with the data base.

Adamint functions include access module initiation, selection and retrieval, data manipulation and control.

Originally developed by Shell Oil Co. in Houston, Texas, Adamint is available now from Software AG for $6,000. The Adabas DBMS to which it interfaces is available from the same vendor for $120,000.

Software AG is at 11800 Sunrise Valley Drive, 22091.

Value Computing puts you in control of your computer operations.

Comput-A-Charge helps measure computer utilization... and distribute its costs.

If you're looking for a complete computer measurement and accounting system that will analyze every job in your data center, compute charges for your users and measure your operating efficiency, then you owe it to yourself to look at COMPUT-A-CHARGE.

Performing in over 400 data centers in the United States and Europe. And available now . . . only from Value Computing.

That's our name . . . and our goal.

VALUE COMPUTING INC.
300 VCI Building/West Marlton Pike
Cherry Hill, NJ 08034/609-429-4200

VALUE COMPUTING INC.
300 VCI Building/West Marlton Pike
Cherry Hill, NJ 08034

I'm interested in more details about Comput-A-Charge:
☐ Please send additional information
☐ Please have a salesman call

Operating System _____
Name _____
Company _____
Title _____ Phone _____
Address _____
City _____ State _____ Zip _____

'FS/I' Uses 360/370 for Forecasts. . .

MANHASSET, N.Y. – Time series analysis for sales, financial and product forecasting of aggregate data and individual unit forecasting of sales demands and reorder points for marketing, manufacturing and inventory management is possible in a Cobol environment with Forecasting System/I (FS/I) from J.E. Ted Broscoe.

Implemented on IBM 360s and 370s, FS/I provides analytical forecasts for six consecutive periods ahead – months, quarters or other accounting periods chosen by the user.

A printed report shows smoothed, weighted moving data averages; trends; seasonal indices; forecasts; and statistical variables for simulations over any number of specified historical data periods, Broscoe said.

Forecasts can be made with or without seasonal data patterns, seasonal pattern smoothing and statistical monitoring for validity of seasonal patterns, he added.

Measurement of trend significance at any desired level of confidence, with different levels for data that is stable, changing or unreliable, is supported by FS/I.

The measurement of a changing trend at any desired level of confidence, with controlled rate of change in the data-smoothing variable to take current experience into account, is another part of the system, Broscoe said.

FS/I also features a range of allowable values for the data-smoothing variable which fixes minimum and maximum limits on average age of smoothed data and a dynamic method of trend calculation which considers changes in the smoothing variable and average age of the smoothed data.

The program logic is set up in such a way that it will sustain periodic, random "data shocks" or aberrations without serious effects on forecast accuracy, the developer added.

Written in "IBM Standard" Cobol, FS/I operates under DOS, OS or VS environments. It has a 22K object phase and 184K load module for each of two programs. The package can be acquired for $250/mo on an annual lease.

Broscoe is in Suite 203, 390 Plandome Road, 11030.

. . .'Cars' Uses PDP-11

RICHMOND, Mich. – Nonprogrammers can create and manipulate reports such as budget forecasts and departmental operating statements on time-shared Digital Equipment Corp. PDP-11s with the Carlson Analysis Report System (Cars) from Carlson Data Systems, Inc.

Written in Basic Plus, the system enables the user to preset column widths and manage both vertical and horizontal spacing and page control. Single- and double-row underlining is also available.

Titles, footnotes, row and column descriptions are under user control, as is selective printing of dollar signs and percent symbols. Cars allows the accumulation of temporary row and column totals without printing, but supports computations of percentages and totals based, if the user wishes, on these temporary accumulated figures.

For problems that cannot be solved by one set of user-written Cars procedures, the system also provides interfaces with other application systems.

Output from Cars can be printed at a user terminal or on a high-speed line printer if one is accessible, the company noted.

Self-loading object code for the Cars processor is available on tape at a cost of $750 for a single PDP-11.

Carlson is at 33850 Armada Ridge Road, 48062.

'Dfast' Enhanced

FORT LEE, N.J. – The Disk File Allocation System (Dfast) package, now marketed by Oxford Software Corp., has been enhanced to include a Volume Table of Contents (Vtoc) reporting feature as a no-cost option.

Used with any IBM or compatible disk systems, including 3340s, under DOS or DOS/VS, the feature allows the user to display the contents and status of his packs on demand.

Oxford is at 1567 Palisades Ave., 07024.

'Ilas,' I Need More Money

WALTHAM, Mass. – Various sources have marketed installment loan packages, but the Installment Loan Accounting System (Ilas) from Baystate Computer Center, Inc. (BCC) is said to provide easier operation, more complete reporting and more efficient processing than most of the competition.

Ilas handles both simple interest and "78s method" loans, including calculation of interest and production of coupon books or bills for bank customers; and generation of trial balances, transaction journals and exception reports for bank management.

In support of collection efforts, the system includes multiple late-charge options and creates interim late notices for late charges, three late notices for overdue payments and appropriate notification to the comaker as well, BCC said.

Ilas creates reports of collection activity and aged delinquency. The file system utilized includes retention of individual payment information for accurate application of payment reversals, a spokesman added.

Developed in ANS Cobol for DOS/VS sites, Ilas is capable of managing multiple banks in a single processing run. Header specifications inserted at the start of each institution's operations shape the processing to each bank's particular needs, BCC noted.

The system requires 100K bytes of main memory and two disks and two tapes. It can be acquired for $20,000.

BCC is at 295 Weston Road, 02154.

'Writer' Costly to Build, Creates 'Indirect' Code

By Ken Seidel
Special to Computerworld

I would like to reply to William B. Simmons' request for insight into the widespread disfavor in which Cobol's Report Writer (RW) is held [CW, June 18].

I believe there are fundamental reasons for dislike of RW:

- It is the least integral feature of the Cobol standard. This means that, in the light of most compiler designs, additional overlays must be provided which bear hardly any relationship to the rest of the compiler's structure. Therefore, its cost to implement is disproportionate to other features.
- The workings of RW are rather indirect, but fixed. Granted, what RW's inventors wanted was that results would be fairly automatic, as ordered data passed through RW's "sieve." However, this design objective is very different from the philosophy evidenced by most of the rest of Cobol – where things are straightforward and "in-line," for the most part.

So, in a real sense, RW's trait of indirectness (where the interrelationships of data are confined to the report section), are not the ones sought by DP management, which doesn't want any subtlety to escape the eyes of the program maintainer five years after the program's creation.

- It is an historical fact that early implementations of RW by IBM were considerably less reliable than the rest of Cobol, and the Cobol D and E compilers excluded RW entirely. This void was filled successfully by the independent software houses, with Mark IV, Culprit, ASI-ST, etc.

I admit to dislike of Cobol's RW feature, but I think this is a matter of taste and reason, rather than prejudice. Let us remember RW is not a required part of Cobol; on the contrary, RW required extensive revisions in going from the '68 to '74 ANS Cobol standard.

Seidel is an independent specializing in implementation of Cobol compilers in Fallbrook, Calif.

WITH DOCS USE YOUR 3277 AS A DOS CONSOLE!

DOCS - Display Operator Console Support - provides the IBM S/360 DOS user with 3277 display unit SYSLOG support. DOCS is simply installed on any DOS system with no changes required by the user.

All 1052 typewriter functions are supported by DOCS with numerous enhancements over a non DOCS environment.

DOCS is quickly and simply installed on any system. All that the user need do is catalog the DOCS distribution tape to his Core Image library, define where the DOCS hard copy file is to be located and execute DOCS. Total installation time required is under 10 minutes.

DOS/VS support for the IBM S/370 135 and 145 will be available at a later date.

DOCS is available from C F S, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time fee lease arrangement for S175.00, S1,890.00 and S5,670.00 respectively. All three lease plans include free maintenance for as long as DOCS is installed.

Send requests for DOCS to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:
Mr. Richard Goran,
CFS, Inc. P.O. Box 662 Brookline,
Ma. 02147 (617) 731-3474 Telex 94-0285

SPEED
DOCS provides significant through-put improvement by the very nature of the speed of the 3277 display unit alone. Operators can even pre-answer messages on the console.

MULTIPLE CONSOLES
DOCS allows from 1 to 4 3277 display unit consoles to be used simultaneously as SYSLOG devices.

MULTIPLE OUTSTANDING REPLIES
DOCS permits messages followed by Reads to the typewriter to remain unanswered without tying up the system. All outstanding Reads are shown in high intensity on the display console(s).

REDUCED SUPERVISOR SIZE & OVERHEAD
DOCS does away with any need for the Console Buffering option in DOS thus providing a savings in the core required by DOS as well as reducing overhead within the supervisor.

ELIMINATES DEPENDENCY ON 1052
DOCS will continue to operate, and allow the entire system to operate, if the 1052 typewriter becomes inoperable. DOCS spools all typewriter data to a hard copy disk file for later printing thus obviating the need for the 1052 to be on-line at all times. Hard copy is asynchronously provided if the 1052 is available. A hard copy listing is also available through a utility program which the user may execute in any problem program partition to list the hard copy file on SYSLST.

NO USER PARTITION REQUIREMENT
DOCS executes in its own pseudo-partition thus allowing the user unrestricted use of the problem program partitions.

MULTIPLE EXTERNAL INTERRUPT KEYS
DOCS provides a separate External Interrupt key for each partition (replacing the use of the the MSG command). This is especially convenient for EDOS users. This function also is useful for GRASP users when communicating with a Background partition problem program.

Advertisement *Advertisement*

ECS Information Systems Expanding
Hiring Project Managers, Computer Programmers

ECS Information Systems, Lexington, Mass. formerly Engineering Computer Systems is currently hiring project managers and computer programmers to meet new business requirements.

John Crawford, president of ECS said that the name change was necessary to conform to legal requirements in states where ECS is opening new offices.

Crawford said that present and long range business commitments have made it necessary for the firm to hire many junior and senior personnel with experience in managing and programming business systems.

He added that more and more, ECS is asked to go beyond the normal requirements for systems houses and take on responsibility for hardware selection, and turnkey installations. This he said has added a new dimension to the field.

With these additional responsibilities plus an accelerating new business curve (over 300 installed business systems) Crawford said that ECS provides an ideal opportunity for people to join a firm that is "taking computer programming out of the back room and moving it into the front office"

Resumés may be submitted in confidence to **Rita Coleman, Personnel Director, ECS Information Systems, Inc., 21 Worthern Rd., Lexington, Mass. 02173. Or call (617) 862-6550.**

Comments Urged on FCC Equipment Registration Plan

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Later this year, users may be able to directly connect noncarrier data modems and other equipment to the telephone network.

Before direct connection is allowed, the Federal Communications Commission (FCC) must approve a detailed equipment registration plan first proposed by the FCC's Office of Chief Engineer and recently reinforced with a recommendation from a joint study board established by the National Association of Regulatory Commissioners.

The joint board report has been submitted to the FCC, and the interconnection office of the Common Carrier Bureau has asked for comments from interested users and others by July 8.

In effect, the plan would eliminate the Bell Data Access Arrangement (DAA) and, instead, a vendor would be required to have his modem or other device registered by the chief engineer's office.

Such registration approval would be granted after passing technical tests to certify the device was acceptable for direct connection to the telephone network. The program would be similar to the type of acceptance program used for amateur and other radio equipment for many years.

Once a particular type of device was approved or registered by the FCC, users would be allowed to directly connect that type of device without any interface or connecting arrangement.

Timetable Uncertain

Exactly how soon the plan could go into effect is strictly speculative. After the July 8 deadline for comments, the interconnection office will have to go over the submissions, and then a recommendation to the commission from the Common Carrier Bureau is expected.

The time it takes to develop the recommendations will depend in part on the number of pertinent comments received on the proposal.

Spokesmen at the interconnection office are hesitant to predict a timetable, but it is known the commission has attached a high priority to resolving the interconnection problem. While there is no assurance the commission will vote to accept the joint board plan, most observers expect its approval.

But even after a positive vote from the commission, some procedural questions will have to be resolved. Obviously, on the acceptance of the new program, the chief engineer's office would be flooded with units vendors wanted registered. This could create a backlog on getting units certified for use.

For the many users now operating noncarrier data sets behind Bell DAAs, some questions have to be answered. Specifically, how will a user be able to eliminate his DAAs in favor of directly connecting the devices he is using?

It is not yet known how AT&T will respond to the join board proposal. Since 1969 when the current DAA regulations took effect, Bell has steadfastly maintained protection was required to protect the phone network against harm. It would not be consistent for Bell to completely alter its position and agree to the registration plan.

For one thing, it would lose the rentals it is now receiving for each DAA connected to noncarrier equipment. And it would instantly have warehouses full of DAAs of no use to anyone.

But Bell has never been able to justify its position about harm. Despite many opportunities to prove its contentions, the Bell System has not been able to prove its allegations of harm to telephone facilities.

For users, a world without DAAs would be much simpler. FCC-approved equipment could be shifted from line to line at will. As pressure mounts for the commission to approve the joint board plan, users should take the time to send their comments to the commission.

Methods Needed to Identify Operators

Terminal Access to Data Creates Privacy Problem

By Ronald A. Frank
Of the CW Staff

GAITHERSBURG, Md. – Validating the right of a terminal operator to access a particular computer system is becoming a major area of concern, according to Ira W. Cotton of the National Bureau of Standards.

Speaking at a recent symposium on trends and applications in computer networks, Cotton said one of the requirements of the federal Privacy Act of 1974 is control of information disclosure. And one of the primary areas of concern in this category is the proper identification of individuals who access systems using terminals outside the physical security area of the DP center.

Controlling personal access to terminals includes controlling physical access to the terminal as well as controlling access to the CPU through the terminal, he said.

The two most well-established systems for personal identification are the use of guards combined with picture passes and the use of fingerprints. Although the latter approach is difficult because of the interpretation of the prints, terminal-oriented recognition systems based on fingerprints may become widespread in the next few years, he predicted.

Three Basic Methods

There are three basic methods for identifying a potential terminal operator. These are based on something the person knows, something the person has or something the person is, Cotton said.

The first includes passwords, the combination to a lock or a series of facts about the person. The second category includes keys to locks, badges, passes and cards with machine-readable information. The third includes physical characteristics such as a person's appearance, voice, fingerprints and hand geometry.

Although each of the methods has advantages and disadvantages, there are evaluation criteria which should be used to arrive at the best system, Cotton said. These include the rate at which authorized persons are rejected and the rate at which impostors are accepted; the time required to achieve recognition; ease of use; and reliability and maintainability.

There is no single scheme that is best suited to all applications, Cotton said. The cost of protection must be weighed against the value of the information being protected.

At the present time, however, the use of positive personal identification systems for terminal usage "does not yet appear to be economically and technically feasible for the majority of users," he said.

Bit-Oriented Control Procedure Aids Synchronous Transmission

DETROIT – Burroughs Corp. has introduced a bit-oriented data communications procedure called Burroughs Data Link Control (BDLC).

This control procedure is designed to provide improvements in synchronous transmission of data between computers, controllers and terminal systems in data communications networks, according to the vendor.

"BDLC is designed to provide greater control flexibility, network integrity, system throughput performance and response time in the high-speed synchronous transmission mode required by many users," a Burroughs spokesman said.

The BDLC capability supplements Burroughs present standard basic mode data communications line control procedures, by which all Burroughs terminal systems can operate on the same communications line and serve different application needs.

The BDLC procedures have been designed to allow mixing of various Burroughs terminals and systems within a BDLC capable communications link.

Of particular significance to users is the fact a data communications link employing the BDLC procedures can become a part of an existing network that contains links operating with Burroughs existing, time-tested standard procedures.

Burroughs will provide support for both procedures, allowing users to tailor their networks to take advantage of the best features of both line control procedures and make an orderly, phased transition to BDLC, the company said.

BDLC is described as a method of data communications that provides an alternate to the commonly used method of transmitting message blocks of formalized character structures.

BDLC is designed for high-speed transmission of "bit streams" over communications lines. With BDLC, the information field may be variable in length and may utilize any code or grouping of bits.

Transmission control may be accomplished simultaneously with data transfer and expanded techniques are provided for exception condition detection and error recovery.

In addition to serving as a link control for data transmission over telephone lines, BDLC provides capabilities applicable to microwave and satellite transmission systems as well as digital data networks.

Standardized Procedures

In developing BDLC, Burroughs has participated with national and international groups seeking to standardize bit-oriented procedures. These groups include the American National Standards Institute (Ansi), the European Computer Manufacturers Association (Ecma), and the International Standards Organization (ISO).

Burroughs standard for BDLC conforms to the new draft ISO High-Level Data Link Control (HDLC) standard and is compatible with the proposed national draft standards. Because BDLC has a modular structure, it can be modified, if necessary, to conform to the standards that are eventually adopted.

In addition, this modular structure will

(Continued on Page 13)

An important offer to users of timesharing terminals.

No terminal supplier can offer you more experience and better service for the cost than Western Union Data Services Company.

Our years of experience in the timesharing terminal field have produced a product line with more than 250 terminal options. So you can be sure the terminals we provide match your specific operating requirements.

You can choose a cost-effective terminal configuration from our wide variety of models, with speeds from 10 c.p.s. to 120 c.p.s.

All Western Union Data Services terminals come with Termicare,® our exclusive diagnostic, maintenance and support service. One toll-free call for nationwide service.

We'd like to show you how you can get the most from your timesharing terminals. Just call us today at 800-631-7050. (In New Jersey, 201-529-1170.) Or write to Western Union Data Services Company, 70 McKee Drive, Mahwah, New New Jersey 07430.

WU data services company
western union

DCC Units Aid Advertising Sales, Traffic, Accounting

MEMPHIS, Tenn. – A remote intelligent terminal that uses a Data General Nova 2/10, a Hazeltine 2000 CRT and a Centronics printer is helping coordinate advertisers and rate schedules and rotate spot advertising timetables at over 100 radio and television stations throughout the U.S.

The terminals, from Memphis-based Data Communications Corp. (DCC), are used in the company's Broadcast Industry Automation System (Bias). One-third of all U.S. television advertising spots are invoiced through DCC terminals.

The intelligent terminal was configured to make it as easy as possible for nontechnical operators at TV stations to access the Bias data base in Memphis. Described as a "total software-driven terminal," the unit is replacing both Burroughs TC 500 and TC 3500 terminals, which DCC previously used.

The Nova-based terminal operates at 4,800 bit/sec over private lines in half-duplex synchronous mode, according to F. Scott Pierce, director of the company's Minicomputer Systems Division. Each terminal uses Bell 208 data sets and information is transmitted to the central site where dual Burroughs DCP processors act as front ends to Burroughs B6700s.

In order to simplify use of the terminals, DCC devoted more than two years to developing its

Terminal Transactions

Preformatted Interactive Data Entry (Pride) software, and the result has been not only easy usage but also a savings in terminal equipment.

With the Nova-based terminal, the Bias customer can have two CRTs, a printer, the processor and maintenance under a five-year plan for about $575/mo.

This compares with the TC3500 used earlier, which cost $350/mo, but that was without a CRT and with a slower printer which operated at 30 char./sec. The Centronics printer on the Nova-based terminal prints at 165 char./sec, Pierce said.

One of the major benefits of the intelligent terminal is that the CRT or printer can easily be replaced by any RS-232 substitute, Pierce said. He contrasted this with the previous method, which used Burroughs terminals and was much less flexible.

When a radio or television station subscribes to the Bias network, DCC sets up a master file for the station in its dual Burroughs B6700 mainframe. The master file is made up of information unique to that station – call letters, the Bias programs and options the station will use and the format for the station's daily program log. The company then builds a data base containing the station's current and anticipated advertising contracts.

The Nova-based intelligent terminal accesses this data base and permits the station to handle three distinct types of activities: sales, traffic and accounting.

When selling time, a salesperson can access the mainframe, which maintains time-slot inventories, to see if a specific slot is available. The information on the Hazeltine CRT lets the salesperson determine if the preferred slot is available, recommend alternatives if it is not and commit time when commercial slots are agreed upon.

The station's traffic activity revolves around its daily log, a schedule of the day's programming, paid and in-house advertising and public service announcements. Every afternoon the station receives a printout of the next day's log on the terminal's line printer so the proper tapes can be prepared.

The computerized log lets stations change or accept advertising up to the time the log is printed – an advantage over manually prepared logs that require ad deadlines three or four days in advance. Even after the daily log has been printed, the station can enter a last-minute change into the computer, and the day's schedule and accounting procedures will automatically be adjusted.

DCC offers the remote intelligent terminals as an alternative to lower-cost remote terminals it previously used with the system. Although the company continually added new programs, routines and reports, the smaller Burroughs terminals with their limited memory capacity sometimes prevented users from taking advantage of the new services.

The smaller devices also could support only one input device, and their 1,200 bit/sec transmission speed did not give some users the response times they needed.

A typical terminal is made up of a Nova 2/10 computer, two CRT display terminals, two line printers, a synchronous multiplexer and 4,800 bit/sec lines to the central computer. It costs approximately $34,000.

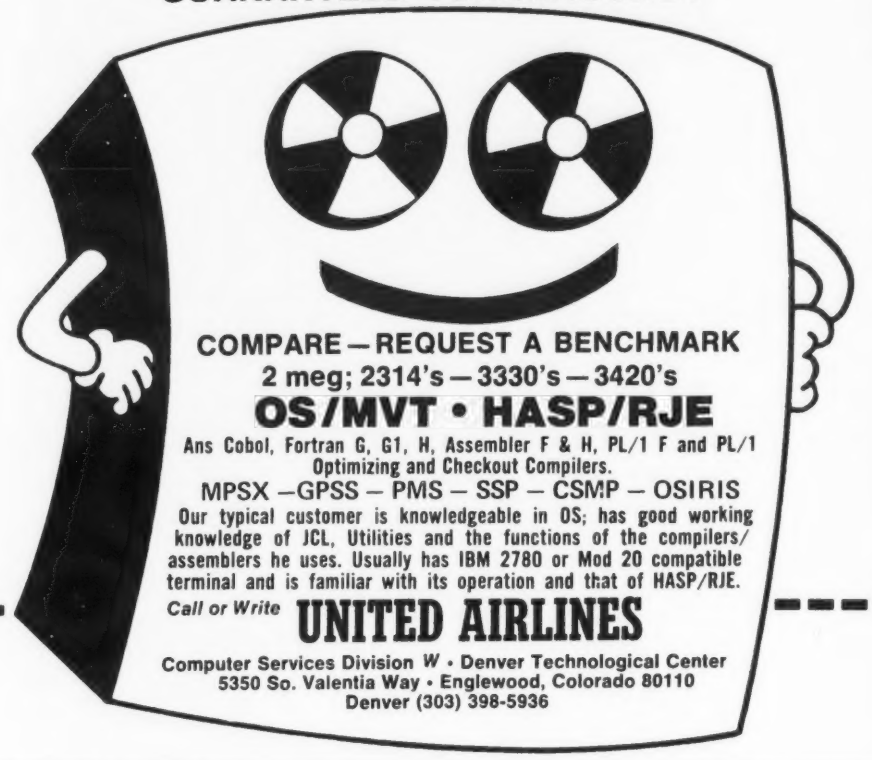
Even though DCC still offers the lower-cost Burroughs terminal as an alternative to the Nova-based terminal, 80% of its customers have chosen the Nova-based system.

Patrick Choate, director of marketing, noted that the low price of the Burroughs terminal was deceptive. Many of DCC's customers had to use two, three or four terminals at one site to get the required processing turnaround and flexibility, he said.

Although the Nova-based terminal initially costs more than the smaller one, it costs less than adding multiple Burroughs terminals, he said.

IBM 360/195 for only 50¢ a Second

GUARANTEED TURNAROUND!



COMPARE – REQUEST A BENCHMARK
2 meg; 2314's – 3330's – 3420's
OS/MVT • HASP/RJE
Ans Cobol, Fortran G, G1, H, Assembler F & H, PL/1 F and PL/1 Optimizing and Checkout Compilers.
MPSX – GPSS – PMS – SSP – CSMP – OSIRIS
Our typical customer is knowledgeable in OS; has good working knowledge of JCL, Utilities and the functions of the compilers/assemblers he uses. Usually has IBM 2780 or Mod 20 compatible terminal and is familiar with its operation and that of HASP/RJE.
Call or Write UNITED AIRLINES
Computer Services Division W • Denver Technological Center
5350 So. Valentia Way • Englewood, Colorado 80110
Denver (303) 398-5936

European EDP Market Dimensions is the single definitive guide to the ever-growing computer industry in Britain and Western Europe.

One volume combines the results of IDC Europa's continuous researches into the EDP market - plus special research and analyses of all other statistical sources available.

Informed notes and comments complement over 200 pages of tables which, in turn, analyse the whole W. European computer market. The report covers this market by manufacturers, models, users SICs, countries, company size and installed value. Expenditure trends are revealed and budgets analysed, in terms of percentages spent on hardware, software, salaries and data preparation.

Destined to become the standard reference on the European computer scene, this latest in IDC Europa's series of Market Studies is a vital tool for all with a stake in the future of computing . . . investors, marketeers and manufacturers alike.

The price of $585 brings this essential volume - plus special privileges for subscribers to additional copies and further updated issues.

Write today, for further information or immediate delivery, to:

IDC Europa Limited,
140-146 Camden St., London NW1 9PF. UK.
or 214 Third Ave., Waltham, Ma. 02154. USA.

IDC europa ltd

for those who need to know

No Manual Paper Tape Conversion Necessary With Device From FTS

NEWTONVILLE, Mass. – Reading messages from 5-unit Baudot paper tape and converting them to Ascii on a standard 33ASR Teletype is now feasible with a device developed by Financial Transaction Services, Inc. (FTS).

The device allows users to input data received on 5-unit paper tapes directly into commercial time-sharing systems or their own systems without the need for manual conversion to 8-unit paper tape and without the expense of special terminals or modifying software, FTS said.

The FTS Model 528433 converter is a self-contained device which mounts behind or in the pedestal of the 33ASR. It performs character-by-character conversion to Ascii of information read from a 5-unit paper tape by the teletypewriter's paper tape reader.

Operating in either local or on-line mode, the $500 converter does not interfere with normal keyboard operation. A bypass switch makes it possible to revert to standard 8-unit paper tape input, the firm said from 24 Munroe St., 02160.

Extend your 3705 Emulator Program... ...and reduce costs.
Add these front-end capabilities:
☐ SPEED SELECT ☐ MULTIPLE CONSOLE SUPPORT
☐ CONTENTION ☐ CODE CONVERSION
☐ SYSTEM SELECT ☐ 3705 ORIGINATED MESSAGES
Standard packages in use throughout the U.S. and Canada. Call today for more information.
COMM-PRO ASSOCIATES
638 14th St. • Manhattan Beach, Calif 90266
(213) 376-1344

Uses Telephone Lines

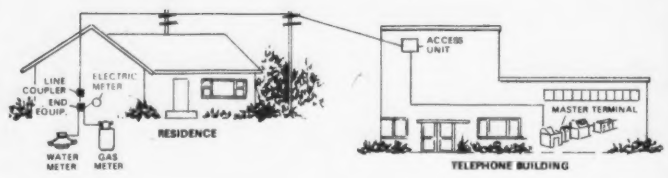
Automatic Meter Reading Tested

MANKATO, Minn. – Six organizations participating in a field trial of automatic, computerized meter reading over telephone lines have gone on-line with an expanded test involving more than 200 homes here.

The project is said to be one of the largest field trials ever conducted of a computer-based system for reading household meters over telephone lines. Signals are transmitted in such a way that there is no interference with regular telephone service.

The system, from Milwaukee-based Badger Meter, Inc., includes a computer-controlled master terminal, communications interface equipment, "access" units in the telephone office, a telephone line coupler and subscriber end equipment installed in customers' homes.

The automatic meter-reading (AMR) program is loaded into a Digital Equipment Corp. PDP-8/M minicomputer in the master control terminal.



Schematic of Typical AMR System

Prepunched Cards

Data processing cards for each customer are placed in one or all of the three card readers. These prepunched cards contain the telephone number, the utility's accounting number, the line coupler frequency, accumulator number and the end equipment "identity" for each customer's home. (The end equipment "identity" is hard-wired into the electronic package before leaving the factory.) Blank cards for incoming data are placed in a card punch.

The system is activated by placing the prepunched cards in a card reader. An operator also can obtain immediate, spot readings on interruptible service through the keyboard of a teletypewriter.

A programmed dialer in the terminal dials one or more of the three access units in the telephone switching office. The number of access units to be used depends upon the number of telephone exchanges involved in the meter reading.

The terminal awaits a verification signal that the access unit is on-line. If the correct signal is not received after several tries, a diagnostic report is printed on the teletypewriter.

The last four digits in each subscriber's telephone number are then transmitted to the access unit. Through the regular telephone test train, the access unit makes a connection to each home in turn.

Busy Lines

If the line is busy, a return signal tells the master terminal to put the call on a busy list and skip to the next card. If the line is not being used, an interrogation tone signal is sent to the end equipment. Hearing this, the line coupler in the customer's home makes the connection for automatic reading.

The signal is sent in such a way that the telephone will not ring. If a customer picks up the phone during a meter reading, the AMR system disconnects itself immediately to prevent any interference with regular telephone service.

Binary meter-reading data that has been stored in the accumulator for each meter is transferred to an encoder in the end equipment. This data has been previously supplied to the accumulator by pulse generators or a switch mechanism on the meters.

An encoder converts the data to mark-space signals which modulate a transmitter in the end equipment. The identification numbers and meter readings are then sent back through the line coupler and access unit to the master terminal.

A receiver in the terminal converts to digital data. Automatic checks also are run for message validity and the correct identification number.

If no error is discovered, the digital data is transferred to punched cards for use in utility billing. A separate card is punched for each meter involved. Although the Mankato field trial uses punched cards, the meter readings also could be transferred to punched tape, magnetic tape or disk memory for processing.

The master terminal tells the access unit to "drop" the subscriber's line and move on to the next home.

When these calls are completed, the terminal disconnects itself from the telephone system.

The punched cards are given to gas, water and electric utilities for use in customer billing.

Control Procedure Bit-Oriented

(Continued from Page 11)

allow compatibility with bit-oriented procedures employed by other manufacturers of communications equipment conforming to national and international standards, the company said.

BDLC features have been designed to be both flexible and adaptable to take advantage of emerging technological developments such as packet switching and other computer-based data communications systems, the firm said.

The essential elements of BDLC are predicated on a few basic principles:

- The assignment of primary and secondary relationships between stations on a data link for control purposes.
- Utilization of a standard "frame" structure for information exchange. The frame consists of an opening flag, an address field, a control field, a variable-length information field, a frame check sequence for error detection and a terminating flag.
- Use of independent numbering for frame sequencing.
- Modularity of procedure structuring and flexibility of the command/response repertoire.

The modularity of BDLC commands and responses permits the selection of specific combinations that are best suited to a particular application or operational environment, the firm said. These include interactive, batch, inquiry/response, conversational or computer-to-computer data communications environments utilizing two-way procedures.

COMPUTER SALES PROFESSIONALS
Advancement Plus...

When we say you can grow with Digital, we're not just giving you a line. We promoted more people last month than most companies do in a year.

If your career is falling flat in its tracks, come see us at Digital, the leader in minicomputer technology. We'll steer you in the right direction.

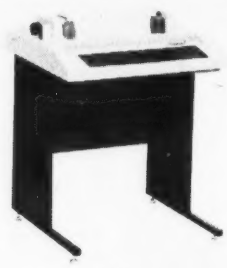
Excellent positions are currently available in the New York/New Jersey and Maryland/Virginia areas in all of the following markets. And each of them offers outstanding potential for managerial growth.

DATA COMMUNICATIONS
PROCESS CONTROL
LARGE SYSTEMS
LAB DATA ACQUISITION
EDUCATIONAL SYSTEMS
OEM

Join us if you have a strong technical background, a knowledge of computer systems and a proven track record in sales.

Please write or call COLLECT, Paul Bennett, Digital Equipment Corporation, Dept. 625 U.S. Route 1, Princeton, New Jersey, 08540, (609) 452-2940.

digital
digital equipment corporation
An Equal Opportunity Employer



DECWRITER II
$79 PER MONTH.

CALIFORNIA HERE IT IS!

NOW in CALIFORNIA
you can lease a **DECWRITER II**
from Randal Data Systems, Inc.
for only **$79 PER MONTH.**

Fast, off-the-shelf delivery and fully supported by service.

Only from Randal Data Systems, Inc., **and** only in California - at this price! All you Californians can find out how to save a lot of gold on your next printer terminal — just call:

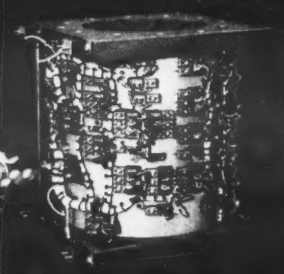
San Francisco	Al Abbott	(415) 961-7011
Los Angeles	Tom Hassett	(213) 320-8550
San Diego	Tom Daly	(714) 454-5655

Randal Data Systems, Inc. can handle all your terminal requirements — for a lot less gold.

RANDAL DATA SYSTEMS, INC.
2807-F Oregon Court
Torrance, California 90503

DECWRITER II is a registered trade mark of Digital Equipment Corporation

Rotating memories due for overhaul?
Come to Burton for it all
...in a hurry!



Save down-time and money by letting the experts, with all the right capabilities and equipment, do the job effectively and efficiently—on-time, every time! Complete service includes the ability to overhaul:
- Disc/Drum recording surfaces
- Rebuilding recording heads
- Motors; Bearings, Harness Assemblies
- Assembly and close tolerance inspection/testing/certification
- 1-year warranty

Call us for a quick quote on all your fast turn-around memory overhaul requirements. (213) 391-0535

BURTON MAGNEKOTE
11334 Playa Street, Culver City, CA 90230

VOLUME KEY PUNCHING
(402) 346-0330

"QUALITY AT LOWER COST"

AMERICANA KEY PUNCH
Redick Tower
Omaha, Nebraska 68102

Better than you need, because someday you could need it.

The BASF 1246 Mod II pack.

Because all double-density disk packs conform to certain industry standards, you might think they're all equal. They aren't. The important difference is the extent to which a manufacturer is willing to go in order to *exceed* industry standards. Because there may be times when your disk pack will have to survive excessive head loading, temperature variations, extended use, and other unexpected trials, we make a pack that will go the extra distance for you. Let's look at a few superior points of the BASF 1246 double-density pack.

The binder that won't quit

As you probably know, magnetic coating doesn't stick to the aluminum disk all by itself. We use a special binding agent to produce an incredibly strong bond. The disk is sealed to prevent oxidation, so you can be sure that the coating won't peel or flake off.

Our own coating process

At this high level of packing density, it is even more important to monitor the thickness of coating deposited on the disk. The problem is compounded by the necessity for progressively varying the coating thickness from the outside toward the inside of the disk, because packing density is greater as the circumference decreases. In addition, unlike conventional disk packs, double-density disks must be magnetically oriented, which calls for even more sophisticated technology. For these reasons, we've discarded conventional coating methods in favor of an exclusive process using our own BASF-designed equipment.

A polished performance

Following the coating operation, we use our own exclusive polishing process to achieve optimum surface regularity. Here again, we're dealing with a double-density medium in which the heads fly much closer to the disk surface than in conventional disk packs. With our new polishing process, we've been able to achieve a surface measurably smoother than the industry norm . . . so flat that the possibility of a head crash being caused by uneven disks is completely eliminated. We might mention here that the coating and binder formulation, combined with coating and polishing techniques, all are important factors in achieving surface hardness, which is the ability of the coated surface to survive excessive or extended head loading.

Achieving balance

Like any rapidly rotating object, a disk pack will behave strangely if not perfectly balanced. In our precision balancing operation, any weighting required is screwed into place, which eliminates the potential for shifting inherent in a conventional adhesive weighting system.

And to make sure . . .

We test our 1246 disk packs to standards much tighter than those of the leading equipment supplier. If anything unpleasant should happen, we'd much prefer it happen here than on your drive. As a regular procedure, we do scratch tests to check coating thickness, impact tests to determine head crash resistance, detergent tests to check resistance to wear and temperature variations, and drop tests to make sure balance and alignment don't shift during shipment. We test to make sure our 1246 disk packs are error-free.

Finally

Our 1246 costs no more than other double-density disk packs. You're already paying for BASF quality . . . you might as well have it. For more information on the 1246 or other BASF disk packs or cartridges, write to BASF Systems, Crosby Drive, Bedford, MA 01730 . . . or call our nearest regional office: in Los Angeles, (213) 386-7023; in Chicago, (312) 343-6618; and in Clifton, NJ, (201) 473-8424.

You're already paying for BASF quality, you might as well have it.

BASF

Output Reports on COM Save Bank $970,000/Year

By Patrick Ward
Of the CW Staff

CLEVELAND – Think of a stack of fanfolded paper 2.8 million sheets high, remembering that 2,400 sheets come in a carton a foot deep.

That tower of paper represents the printed output the DP shop at the Cleveland Trust avoids each month by producing half of its reports on computer output microfilm (COM).

Savings come to about $970,000 annually, James H. Glueck, operations research analyst, said.

The bank produces 134 reports on COM, 80 of them daily. This represents COM usage by almost every department in the bank, Bruno Putze, computer operations officer, noted.

The Cleveland Trust's COM usage ranges from loans, accounting, personnel and customer service reporting jobs to automatic teller and automated tape library reports, program listing and computer logs, Putze said.

A careful COM education program for the user departments came ahead of widespread implementation, Putze said.

"If you take the time, explain the viewer, explain how the index in the fiche works and explain the advantage of it, people will like it," he said.

But "if you dump it on them, they'll reject it," he added.

Evolution of COM

The Cleveland Trust first went to COM in 1969, before paper prices took their sharp jump.

Management needed a corporate trust master file report printed more frequently than every quarter, because the information was not current over that interval. The DP shop, however, did not have enough spare hard-copy printing capacity to produce the report every month as management would have liked.

To better handle that job and others, the DP shop installed an on-line Memorex 1403 COM recorder in 1969. While the corporate trust master file report had been a weekend job for the hard-copy printers, the Memorex unit made monthly printing of the report practical.

But the on-line COM system had disadvantages. "We would notice that, whenever the microfilm was operating, the throughput of our IBM 360/50 was reduced drastically," Putze recalled.

To be free to add more COM jobs without worrying about system throughput, the bank went to an off-line Kodak COM-90 unit in 1971.

With Kodak's help, the bank surveyed its user departments and soon had 50 COM jobs running, compared with the eight or 10 on the Memorex system.

The bank replaced the Kodak recorder with two Pertec (now Bell & Howell Model 3700) stand-alone units in 1973 because it wanted to gain greater COM capacity and a backup recorder. It bought a third unit this year.

Without backup, a COM user whose recorder is down resembles "a guy without a paddle trying to go upstream," Putze remarked.

In 1973, Cleveland Trust set up the COM recorders in a separate department close to the DP shop. Three shifts of two operators work five days a week turning out the 2.8 million original page frames that go through the department monthly, 90% of them in microfiche form. Downtime accounts for 2%, Glueck said.

The bank's application development staff and the user departments decide which jobs will go onto COM, Putze said.

Staff members can determine printing and microfilm costs on a preprinted microfilm report comparison worksheet which compares the computer charges per print line of paper with microfilm, the cost of paper with film, and the expense of decollating and bursting with film duplicating.

The length of the report and its frequency are other important factors in deciding whether a job should go on COM, Putze explained.

On-Line COM?

CLEVELAND – The Cleveland Trust uses computer output microfilm (COM) in a customer service application that might be considered a candidate for on-line CRTs.

Before setting up this COM application, the bank needed one to two days to answer a customer asking if and when a particular check had been cashed between cycle dates of statements.

Now 11 operators with headsets and sets of microfiche records which the bank produces nightly can answer these inquiries in 12 to 15 seconds, Bruno Putze, computer operations officer at the bank, said.

The information is as current as that available with an on-line inquiry system using nightly batch updates, he stated.

Each operator receives a complete set of the daily check clearance report. The data occupies from 55 to about 92 fiche, with each fiche containing the equivalent of 208 pages of computer printout.

Putze said the bank did not make any real cost comparison between the COM approach and on-line CRTs, "since we didn't have the necessary disk resources to keep that information on-line all day long."

He does think CRTs would be quite a bit more expensive than microfiche viewers, he said.

The bank had tried two Kodak Miracode II automatic microfilm retrieval stations in another application, Putze said. The devices worked with 16mm roll film; operators would key in the code for the frame they wanted, and the automatic device would retrieve and display it.

But "in our situation, it wasn't the right thing," Putze said. The records were in sequential order, and the automatic unit spent a lot of time reading along the length of the 100-ft film strips.

The bank found that operators could find the right frame faster in boxes of microfiche, and so the automatic devices were replaced.

The automatic devices are better suited to working with randomly arranged records, Putze remarked.

In Controlling Inventory

Firm Gains Flexibility With Own CPU

MINNEAPOLIS – An in-house system has given Nortronics, Inc. more flexibility in coping with scarcities of critical parts than the service bureau the firm had previously relied upon, according to Michael D. Kangas, the firm's manager of information systems.

Nortronics manufactures 5,000 different kinds of magnetic heads for use in a variety of industries. At any given time, the company has 2,000 open orders moving through its factory.

Each of the orders requires hundreds or thousands of any of 20 to 30 different raw materials, parts or subassemblies drawn from an active inventory of 15,000 listings.

Because the complexity of its operations had outstripped the capabilities of conventional accounting and forecasting techniques, Nortronics began using a computer service bureau in 1971. The first major job was materials requirement planning. In time, a second service bureau was engaged.

Even so, Nortronics found its outside suppliers of DP were relatively limited in approach.

For economic reasons, they could only offer software which could be used by a number of clients. Customized programs were too expensive. As a result, Nortronics decided to acquire its own computer.

"We came up with an NCR Century 101 computer which leases for less than we'd been paying the service bureaus. We have our own staff now, so we can develop any type of specialized programs management may need," Kangas reported.

Installed in September 1973, the system has a 30K CPU which is expandable to 64K, a 300 card/min reader, a 300 line/min printer and an NCR 657 disk drive. The last, using two removable packs, puts 60M characters of information on line.

Two of the most important tools the DP department provides management are the planned order report and the materials requirement report.

At the end of each week, all open sales orders are passed against the inventory and bill of material files.

The inventory file contains the time required for manufacture or assembly, lead time for orders and quantities on hand, on order, safety stock and allocated.

The bill of material file has the raw material and/or component requirements for all inventory items.

Typically, one model of a Nortronic magnetic head might consist of Part A, which is a product of B and C, while B is a product of D and D, and C is a product of F and G. Another model might be identical except that C is a product of L and R.

The processing of the orders against the inventory and bill of material files results in the planned order report. This displays to production/inventory control what is required in terms of production and purchase orders. These are spelled out for each of the 26 forthcoming weeks.

Information is fed back into the system from the stockroom with respect to issues, completed production and shipments. The last triggers customer billing.

Prices paid for raw materials and components are used to update standard costs. Together with data from employee time cards, this information is combined to show actual costs of manufacture compared with established standards.

On a monthly basis, reports are generated which show the cost of sales, the volume of production and variations from standard costs, the inventory of work in process, the costed stockroom inventory and the costed inventory activity. In essence, these state profit and loss.

SCDP Offers Checklist for Protecting Data Center

HUDSON, Mass. – While fires, explosions and natural disasters will probably always threaten data centers, "the large proportion of them are avoidable, preventable or, at the very least, minimizable," according to a checklist called *"Disaster in the Data Center."*

Published by the Society of Certified Data Processors (SCDP), the $5, 23-page booklet is intended to bring together the questions that should be asked "as data centers are planned, modified or used."

The first of the booklet's five parts, entitled "The Facility," poses questions about the physical facility itself, "dealing with its construction, its proximities, its contents. The intent is to make you aware a well designed and utilized facility can assist you in preventing or minimizing a disaster."

Some of the questions: "Is the upper ceiling constructed so as to conduct water from higher levels away from the computer facility? Has the floor above been made watertight? Have pipe and wire openings been made watertight?"

"Disaster Protection," the second part of the booklet, asks about "detection, alarming and protection equipment, as well as the use, manually or automatically, of auxiliary equipment and sources of supply."

Questions here center on the type of detection and protection equipment in the facility, whether the center includes smoke detection equipment, heat rise detection equipment and so on, and whether any of these detection units are mounted inside the cabinets of vital system components.

'People and Procedures'

"People and Procedures," looks into "what people will do in the event of a disaster – how they will react, what specific steps they will take, where they will go, what responsibilities they will maintain and what duties they will perform."

Are there specific procedures for use in the case of fire, such as power down procedures? And do DP staffers, security officials and in-house and municipal fire officials have access to the information, the booket asks?

The fourth part, "Disaster Prevention and/or Recovery," concentrates on what the user can do to prevent the occurrence of a disaster and/or recover from the one he had.

Questions here center on preventive maintenance such as regular inspection of automatic detection and protection systems, fire drills and recaps of suggestions made elsewhere in the booklet.

The booklet concludes with "Disaster Strikes; What To Do When; The Aftermath." This list of questions is intended to remind the user of what must be done to "mop up."

Questions here mention backup facilities and making sure in advance they can be effectively used.

The SCDP is at 38 Main St., 01749.

Bell & Howell Enhances 3700 COM Unit

NEWPORT BEACH, Calif. – The Bell & Howell Model 3700-III computer output microfilm (COM) recorder is said to offer twice the film capacity previously available and to produce exposed film approximately 20% faster.

The unit also provides improved film registration accuracy and simplified operating procedures, the firm said.

The 3700-III contains a high-speed, multiformat camera system which can generate both 16mm roll microfilm and 105mm microfiche in all National Microfilm Association (NMA) formats. Film capacity is 200 feet for 105mm and 400 feet for 16mm.

Range of Ratios

Through incorporation of the camera lens, standard reduction ratios of 24:1, 42:1 and 48:1 are available.

The 3700-III COM recorder accommodates either 7- or 9-track magnetic tapes in 556-, 800- or 1,600 char./in. densities. The unit's printing speed ranges up to 26K line/min., or 160 char./line.

Cobol Compatibility

COM management software for IBM 370/360 users and for systems supported by an ANS Cobol compiler is available for COM installations where formatted, titled and indexed microfiche is required.

The 3700-III leases for between $1,800/mo and $2,500/mo, depending on options, from the firm at 1451 Quail St., 92660.

Burroughs Designs Storage Racks

ROCHESTER, N.Y. – The Compactarack line of continuous forms binder storage racks was designed to give maximum capacity in minimum space, according to Burroughs Corp.

Compactarack equipment is available in a variety of sizes and configurations. Capable of storing binders which house burst or unburst forms, Compactarack equipment can be set up for either vertical drop-in binder storage and retrieval or horizontal slide-in usage.

Capacity is from 13 linear inches for the basic Compactarack to 250 linear inches for the large control system.

Modular design permits addition of new units when added capacity is required in either stacked or side-by-side configuration, Burroughs said. Casters are available for most units so they can be moved easily among workstations.

The basic unit costs $53.30 from Burroughs' Business Forms and Supplies Group, P.O. Box 910, 14603.

Scanner Upped

NORRISTOWN, Pa. – A 1,600 char./sec scanner enhancement has increased overall throughput on Scan-Data's 2250/1 optical character recognition (OCR) systems by as much as 79%, according to the firm.

Available on Scan-Data's 450 and 475 models, the enhancement doubles their existing scanning rate and increases throughput from 20% to 70%, a spokesman said.

The throughput enhancement is most significant in OCR applications with high data content, especially handprint, he said.

Available in August, the enhancement leases for $400/mo on a two-year lease. Maintenance is $100/mo from the firm at 800 E. Main St., 19401.

Model 385 Detacher Comes in Five Styles

NIAGARA FALLS, N.Y. – The Model 385 continuous forms detacher from Moore Business Forms, Inc. comes in five different styles to help users choose the right detacher without having to purchase unnecessary capabilities.

The Model 385 detacher starts with a basic unit with a fixed-speed drive of 110/min and a drop-style outfeed stacker.

A series of optional features, available in other units, permits the addition of various operating benefits up to tractor-slitter infeed, margin slitter, midform slitter, variables speeds control from 0- up to 300 ft/min, electronic static eliminator and an independently variable speed conveyor output delivery.

All units include a jam-detector turn-on/turn-off switch, a knob adjustment to facilitate conversion to different form lengths and a last-form ejector.

Model 385 handles forms widths from 4-3/4 in. to 19 in. and depths from 2-1/2 in. to 12-1/2 in. Capacity is one- to six-part completely fastened forms in up to 125-lb basic weights.

Price ranges from $2,628 to $3,642 depending on the type of detacher unit chosen from the firm at 1001 Buffalo Ave. 14302.

Wright Line Adds System For Faster Printout Filing

WORCESTER, Mass. – The CPS Cube System from Wright Line, Inc. is said to be a faster and more economical printout filing system than conventional binding methods.

The unit contains up to 12 trays, each of which has a flexible post-binding mechanism to hold printouts inside. The trays slide out of the unit for carrying to another room.

Each tray in a unit of 12 can hold up to one-half inch of printouts. Trays are adjustable to handle various sizes.

A 12-tray CPS Cube System costs $85 from the firm at 160 Gold Star Blvd., 01606.

"The DATACOM/DC data communications monitor gives us big bank data processing sophistication on a smaller bank's budget."

says Carroll Sullivan,
Vice President,
The First National Bank
of Fort Worth, Texas.

"DATACOM's efficiency," he explains, "has allowed us to grow without upgrading hardware, and the ease of coding with DATACOM has greatly reduced development costs on new applications. The wide range of hardware supported by DATACOM also gives us great flexibility in making equipment decisions.

"Add to that the exceptional support provided by CIM, and you understand why we've added DATACOM/DB as our data base management system. We know DATACOM will continue to keep us on the forefront of bank data processing at a fraction of the normal cost."

Find out why Carroll Sullivan and other DATACOM users are pleased to be in on "the best kept secret in software." Call or write **CIM 3707 Rawlins • Dallas, Texas 75219 (214) 526-4280.**

DATACOM/DC Data Communications Monitor
DATACOM/DB Data Base Management System
The Resource Savers from CIM an insyte company

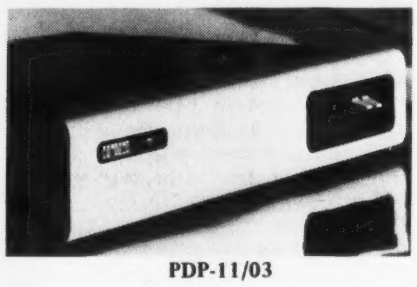
SALE or RENT
I.B.M. UNIT RECORD MACHINES
026-029-059
ELIGIBLE FOR IBM M/A
FOR IMMEDIATE DELIVERY
call 201 343-4554
Wm. MARION CO., INC.
P.O. BOX 309
HACKENSACK, N.J. 07602

Mini Bits

DEC LSI-11 Put in Box, Becomes Firm's PDP-11/03

MARLBOROUGH, Mass. – Digital Equipment Corp. has introduced its boxed version of the LSI-11 microcomputer, labeled the PDP-11/03.

The system contains a 16-bit silicon gate N-channel, MOS LSI processor with mem-



PDP-11/03

ory, serial interface, power supply, rack-mountable enclosure and operator's front panel. It is available in 4K MOS random-access memory (RAM) and 4K core configurations in both 115 Vac and 230 Vac versions.

Delivery is scheduled for September with a list price of $2,495 for the 4K MOS RAM version and $2,925 for the 4K core version.

The following options are available: extended arithmetic chip, serial line interface module, parallel line interface module and four expansion memory modules.

Like the LSI-11, the PDP-11/03 can operate the 400-plus instruction set of the PDP-11/40 at speeds comparable to the PDP-11/05, DEC said.

The N-channel processor incorporates the Western Digital chip set consisting of a control chip, data chip and two microcoded read-only memory (microm) chips.

An extended arithmetic option is contained in a fifth LSI chip which can be plugged into a socket available on the microcomputer module.

Remex Adds Punch Mechanism

SANTA ANA, Calif. – One of the smallest sized high-speed tape perforator mechanisms ever designed for system integration has been introduced by Remex, the vendor said.

The RPM 6120 perforator mechanism offers a 120 char./sec punch speed, is bidirectional and will punch tape of five to eight levels, roll or fanfold, in paper or mylar, the firm said.

A six-level, advance-feed typesetter version is available.

The design of the 6120 incorporates a motor-driven tape feed and sprocket drive said to give positive control of longitudinal registration. There are no required registration adjustments for the life of the product, the firm added.

The 6120 is priced at $950 from the firm at 1733 Alton St., 92705.

Memory Systems Fit GA SPC-16s

FORT LAUDERDALE, Fla. – Standard Memories has unveiled two core memory systems compatible with General Automation's (GA) SPC-16 CPUs.

Choices include the Model A8K16MM (8K words) and A16K16MM (16K words). Both models are identical in form, fit and function to core supplied by the mainframe manufacturer and are completely pin-compatible with all submodels in the SPC-16 family, the company said.

The 8K system is priced at $1,450, the 16K system at $1,995. Pin-compatible Standard core memory is also available for SPC-18 systems (8K for $1,595).

The firm is at 2801 E. Oakland Park Blvd., 33306.

Mini Does More Than Communicate

GARDENA, Calif. – Form-O-Uth is the first Sears supplier to successfully access that retail giant's Senden network with a mini-based business system.

Currently midway in a series of overlapping installation phases, Form-O-Uth uses its Qantel system for both data communications and in-house business applications.

Data communications are single-line asynchronous at 1,200 bit/sec – handling orders from some 400 Sears stores, instructions to four Form-O-Uth plants and interim inventory control.

Accounts receivable is the first in-house business application being handled by the system; aged trial balance and billing are scheduled for summer start-up.

Form-O-Uth exclusively sells some $15 million worth of women's undergarments annually to Sears. Prior to the late 1973 delivery of the Qantel system, Form-O-Uth handled its communications with the Sears Senden network via ASR 25 Teletype and its business applications with an IBM 1401.

Faced with an alternative of installing a limited AT&T 4210 (as many Sears suppliers had for access to the network), Jack Sallow, vice-president for merchandise control, and controller Harry Wood decided to review other options in intelligent business communications systems.

Form-O-Uth evaluated offerings from IBM, Burroughs, Singer, Xerox, Digital Equipment Corp. and Qantel, eventually selecting the latter for its communications capabilities.

Form-O-Uth ordered one of the largest Qantel systems ever shipped: a System 1200 with 48K of processor memory, four 12M-byte disk drives, three CRT display/entry terminals, two 300 line/min printers, a 1,600 bit/in. tape drive, a programmers' console and the necessary communications controller (actually a small minicomputer itself).

Delivered in December 1973, the system replaced the Teletype six months later. Software was installed by Recordata West of Los Angeles under the direction of Ed Kasman.

"We're frankly excited about the communications capabilities of our system," Wood said. "Even without the specific demands of the Sears Senden network, those capabilities would be impressive."

DP supervisor Fred Allemand explained how Form-O-Uth's system meshes with the network: "Sears' stores order our products through the network, which is managed by an IBM 370 in Chicago, at a rate of some 350 orders per day.

"Our system communicates directly with the 370, stores our orders on disk and prints out for us an edited version of those orders in a packing list format. We then turn around and communicate with our plants via their individual 4210s.

"Plant managers receive all appropriate captured data in the form of preprinted 'shipping order forms,' which list orders in schedules according to their shipment priority. Shipments then move directly from the appropriate manufacturing plant to the requesting Sears store in order of need.

"Error control is assured by communicated order totals, which can be checked by plant managers against order documents and rectified – in the event of discrepancy – over the phone.

"Our new system cuts as many as three days off the time it took us by mail in the past," concluded Allemand, a five-year veteran of Form-O-Uth management. "That kind of response to orders with our new system, we feel, increases our dependability as a supplier and contributes to sales volume."

In addition to order entry, the Form-O-Uth system is now performing several accounts receivable functions.

Within a month, Allemand expects to complete the second phase of the installation with aged trial balances and billing. Billing will be handled by comparing plant shipments to the open orders on file.

A basic billing document will then be sent directly to the ordering store, with system-produced copies going to Sears' appropriate control store, to Form-O-Uth's bank for payment reconciliation and to the company itself for backup and control.

When required, the system will automatically forward receivables updates and aged trial balances. Discrepancies will be resolved by individual Sears stores through one of five control stores which will then deal with Form-O-Uth.

The third phase will follow closely with local payroll, accounts payable, financial statements and detailed general ledger reports. Later phases will include inventory and production control entires and inquiries and reports and will take advantage of historical records to more closely match forecasts to actual production, a match that is particularly critical in the material- and labor-intensive garment production business.

Substitute on a Substitute

IBM 1130 Out, Meta-4 In, IBM 1403-2 In

GREENSBURG, Pa. – When the DP needs of Overly Manufacturing Co. outgrew the capacity of its IBM 1130 computer, the company believed it faced a major expenditure.

"Even if we switched to a larger computer from the same manufacturer, new software and other conversion costs would have been about $50,000," according to C.E. James, DP manager for the company.

However, after extensive research on alternative equipment, the company created a system that not only had more processing capability than the original DP system, but also improved printing quality, speed and flexibility.

Overly switched to a Meta-4 computer made by Digital Scientific Corp. The computer is said to be faster than the IBM 1130 and leases for a lower price, and its software emulates the IBM 1130. Therefore, conversion costs were minor.

However, the Meta-4, like the 1130, normally operates the IBM 1403-6 or -7 printer, which are not as advanced as other IBM printers. In addition, an expensive multiplex-adapter unit is necessary to interface the computer with the printer.

Grumman Printer-Controller Chosen

A printer controller from Grumman Data Systems Corp. did a more efficient interface job at less cost than the IBM interface and also made possible the use of the IBM 1403-2 printer. The printer controller also is plug-in compatible with the 1403-3 or -N1 printers, James noted.

The 1403-2 printer is capable of printing 600 line/min, compared with 340 line/min possible with the model formerly used by Overly. In addition, high-speed paper slewing and double or triple spacing are possible for the first time, James noted. The printer also prints 132 columns instead of 120. All are important factors in increasing the output of the system.

In actual operation, James found the Grumman G1403/1130 printer controller increased processing speed in other ways.

(Continued on Page 19)

400-, 750 Line/Min Printers Offered for S/3 Models 10, 15

IRVINE, Calif. – Business Systems Technology, Inc. (BST) has 400- and 750 line/min plug-compatible printers for System/3 models 10 and 15.

The BST/400 and BST/750 printers are said to offer all the major features found with the IBM 5203 and 1403, with an increase in performance at lower cost.

On a one- to five-year lease, the BST/400 printer saves from $1,008 to $2,748 annually over IBM's 5203 on a monthly rental and offers increased performance of 100 line/min, the firm said.

The BST/750 offers high-speed processing with a leased savings of from $4,536 to $7,296 annually over a 600 line/min 1403 rented monthly, BST added.

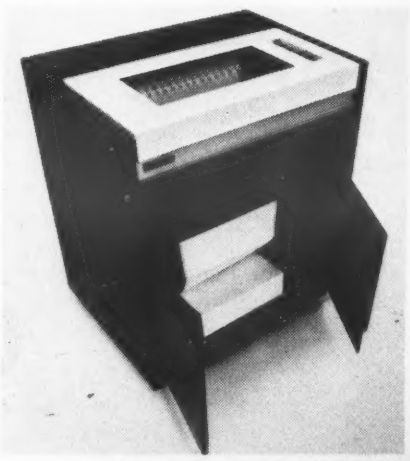
Both of the BST printers utilize chain trains and are fully buffered to enable the CPU to perform other processing tasks between printer line settings.

Sensing devices on the printers alert the operator if paper runs low and automatically halts it if paper out or paper runaway conditions exist.

The BST/750 also has a paper jam sensor. None of these are available on the 5203, and only two are on the 1403, BST said.

By using one printing hammer for each of the 132 print positions, the BST machines "operate more efficiently than the 5203, making as many as six quality print copies," the vendor said. Multipart forms from 3-1/2-in. to 19-1/2-in. wide can be accepted.

The printers are said to be identical to the IBM machines in character set, vertical line spacing and character spacing. They operate under standard systems software and require no change to user programs, BST said from 3015 Daimler St., 92705.



BST Printer for System/3

Mini Helps Consultants Analyze Engineering Problems

ST. LOUIS – John F. Steffen and Associates, an engineering consultant firm here, uses its minicomputer to save time in the calculation of such problems as building costs, risk analysis and energy conservation.

The purchase of the minicomputer was the most recent in a series of data systems upgradings that Steffen began seven years ago when it started with time-sharing and continued through an IBM System/3. Today the firm has a Hewlett-Packard (HP) Model 3000.

Some of the data from the computer analysis is used to develop mechanical and electrical systems for hospitals, office buildings, high schools and colleges.

Data on heat loss and gain is processed through a software model to determine the most effective energy-conserving heating and air conditioning equipment. Lighting systems are developed in much the same way, using data on room size and job requirements.

Taking advantage of company-developed Monte Carlo simulation software, involving a random number generator, the firm developed a risk analysis program to estimate building and construction costs. "Here is where the HP 3000 shows its power over both predecessors," John F. Steffen said.

"For example, on the System/3, the risk analysis program took 10 hours to run the 5,000 simulations. The HP 3000 does the same work in 10 minutes," he noted.

"We also do our more traditional accounting programs on the minicomputer," Steffen added. "These programs are coupled to a time/cost accounting system which evaluates time records each night to predict total project costs in man-hours expended."

The system's hardware consists of the HP 3000 with 96K core memory, tape drive, 47M-byte disk memory, 300 line/min printer, a Terminet 300 console and three HP Model 2640 CRT terminals.

"We have tried to develop a situation where, instead of bringing in outside programmers – who may know little of our work – we train our engineers to do their own programming. This not only saves time, but reduces the errors inherent in multiple translations from individuals of one discipline to those of another," Steffen said.

"To further streamline operations, our entire office has been hardwired with CRT jacks. With a total of 26 of these jacks in offices and even in the conference rooms, the entire place becomes one large data processing center," he added.

Firm's Land Surveying Jobs Run On Programs Written In-House

HAMMERSMITH, England – A minicomputer is being used by the construction firm of George Wimpey & Co. Ltd. to carry out a wide range of land surveying programs. But the programs were written in-house by Wimpey staff.

Wimpey's decision to "go it alone" resulted from an extensive study of other possibilities. Surveying packages already available proved to have a number of disadvantages; in particular, they were uneconomical except on large surveys and required field data to be heavily edited before it could be used.

Wimpey also felt programs which were to be used by engineers and surveyors would be best designed by the engineers supported by in-house computer specialists.

As far as the computer hardware was concerned, it was decided not to use the firm's own ICL machine, since this was largely committed to commercial work and would not always be available.

In addition, minicomputers proved to offer a high ratio of power to cost, and a low ratio of size to power. The company consequently chose a Data General Corp. Nova.

The programs, which were initially developed on an IBM 1130, were designed as far as possible to be compatible with existing manual techniques and to form a connected suite, from the basic surveying program to a range of engineering applications, particularly in the field of road design.

The initial program on the suite uses the basic field data to produce a plot of the site plan. Misclosures are automatically adjusted, and the program allows for any number of minor traverses. The contouring program uses data selected by the surveyor, who eliminates irrelevant detail such as ditches to plot the contours of the site, interpolating curves where necessary.

A number of other programs have been developed on the Nova, with others being developed or planned for the future. These include a road design suite, environmental programs and a surface water design suite.

The computer in use at Wimpey is a 32K Nova 2/10 with twin disks. Other equipment includes a drum plotter, matrix printer, paper tape reader and punch, card reader and teletypewriter.

Raymond Adds 'Imposter'

GLEN COVE, N.Y. – The "Great Imposter" tape cassette drive from Raymond Automation Labs, Inc. has a maximum data transfer rate in excess of 10 kbit/sec, the firm said.

The Model 1000 can be used, the vendor said, with any computer system without hardware or software modifications. A selector switch allows the user to optionally utilize his original peripheral device, also without hardware or software changes, the firm added.

Standard features include a tape search mode which enables the user to select data to be read from any section of the tape.

Available options include read-only or read/write capability, read or read/write error correction, output data code conversion and full RS-232C interface capability. Dual readers are also optional.

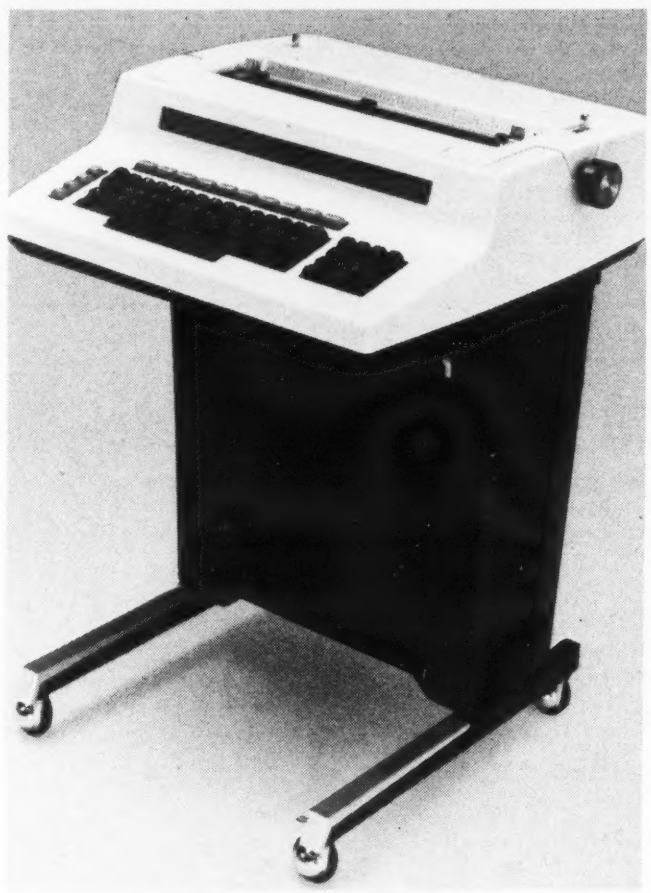
The basic read-only module comes with a peripheral interconnection cable for less than $3,600.

The firm is at 7 Bridge St., 11542.

The Q Terminal

GEN•COM SYSTEMS MODEL 300Q

The stylish **Model 300-Q** adds a new dimension to Gen-Com's line of high quality 30 cps ASCII communications terminals. The **Model 300-Q** offers you many standard features such as: RS232 interface, horizontal tab, vertical tab, margins control, proportional space mode, dual plotting techniques, 2741 emulation, 10/12 pitch and complete forms control!



Programmability

The **Model 300-Q** utilizes the Intel 8000 series microprocessor which is fully programmable. Special line disciplines, block mode communications up to 9600 baud, code conversions and intelligent data entry, may be easily implemented to fit your needs.

Improved Quality Printing

Utilizing the Qume mechanism with 6 level hammer intensity and multicopy adjustment, the **Model 300-Q** affords excellent print quality. Higher average print speeds up to 55 cps are optional on the **Model 300-Q.**

Keyboard

The **Model 300-Q** has an exclusive keyboard that has an extended numeric pad, n-key rollover and a factory reprogrammable memory for key relocation or special key coding.

Service & Reliability

It's quiet (no fan). It's mobile. It's reliable! Gen-Com Systems has installed over 1,000 Series 300 data terminals nationwide. Plus, modular design of the **Model 300-Q** (only 4 modules, all replaceable in less than 20 minutes!) allows ease in repair by our nationwide service network.

We've Got the Options

Gen-Com Systems offers useful accessories so you can choose a whole data communications system. We have paper tape and cassette storage along with our DM-1 flexible disk which has complete offline data editing. Gen-Com also offers standard paper handling accessories such as: pin feed platen, adjustable forms tractor, dual platen and a document insertion attachment.

For more information on the MODEL 300-Q's low price and 15-30 delivery, write us or call the nearest Gen-Com office below.

Offices:

Corporate:
1151 Triton Drive, Foster City, CA 94404
415—349-2374

Sales:

New York	212—867-0240
Boston	617—235-5520
Rochester	716—385-3021
Pittsburgh	412—823-6116
Chicago	312—887-8777
Detroit	313—427-2741
Minneapolis	612—831-1555
Los Angeles	213—478-6087
San Francisco	415—349-2374
Seattle	206—852-0272
Portland	503—297-2103
Denver	303—795-1960
Salt Lake	801—487-8281
Phoenix	602—267-9429

GEN•COM SYSTEMS, INC.
1151 Triton Drive
Foster City, California 94404

Gentlemen: Please send more information on your **Model 300-Q** data terminal.

Name _____

Title _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

Gen•Com

Minis to Help College Students Make Career Choices

PRINCETON, N.J. – Junior college students may soon be turning to minicomputers for help in planning their working lives.

The Educational Testing Service (ETS) has developed a system which puts the minicomputer's ability to store, retrieve and manipulate career information into the student's hands.

The goal is to increase the student's freedom of choice, to develop understanding of how to appriase a career and to improve his ability to make informed and rational career decisions.

Called the System of Interactive Guidance and Information (Sigi), the ETS product will be tested in four junior colleges during the coming year.

Each of the schools will have a dedicated Digital Equipment Corp. PDP-11 minicomputer with 64K under the RSTS/E time-sharing monitor. The systems will have up to 17 CRTs for the use of students.

Sigi is intended to complement, not supplant, school guidance counselors, ETS said. The testing service began developing Sigi in 1968 with Carnegie Corp. grants. Evans, Griffeths and Hart, Inc. of Lexington, Mass., adapted ETS' flowcharting and scripts to run under DEC's RSTS/E time-sharing monitor.

Students using Sigi first go through an overview of its six subsystems. Then they are free to use any subsystem whenever they want, inputting their answers through a multiple choice format.

In the "values" subsystem, students learn making a decision often requires choices between competing values.

The system presents 10 values for the students to weigh, and then puts the choices in graphic form for students to reconsider and readjust if they want.

To help students scrutinize their values more closely, Sigi goes through some game-like frames where the student has to judge between values.

The system then points out any inconsistencies between the students' previous weightings and the preferences shown in the game.

After playing as many rounds of the game as they wish, the students reweight their values for a profile of their examined values.

In the "locate" subsystem, Sigi displays occupations that correspond to the student's values. The student can change the values to generate a list of other careers worth considering.

In the "compare" subsystem, the student can ask pointed questions about an occupation's work activities, entry requirements, income, personal satisfactions, conditions of work and future outlook.

Students have a chance to judge their chances of success in various college career programs in the "prediction" subsystem.

The "planning" subsystem shows the requirements for entry into an occupation so students can judge whether they are willing and able to meet them. If they are undecided, the system displays the rewards and risks of studying for that occupation for a semester or of switching to another program.

The final subsystem, "strategy," brings together a student's values, occupational information and predictions for three occupations at a time.

Sigi retrieves the weights previously assigned to values and may revise them to show the current importance of each value to the student. It then shows how other occupations can satisfy each value.

The sum of each weighted value provides an index of the occupation's overall appropriateness for the student.

Firm Subs In 1403-2 For 1130 Substitute

(Continued from Page 17)

For example, printing requires less computer time than before. The IBM multiplex unit steals two memory cycles for each printer character. The Grumman interface steals only one.

The IBM system took more time to resolve invalid characters, James added. The IBM interface required three revolutions of the print train before canceling and correcting the instructions to print an invalid character.

The printer controller recognizes the invalid character when it is put into buffer memory and cancels the function before print orders are generated.

No Degradation

"An invalid character degraded operation of the IBM system to 50- to 100 line/min compared with no degradation with the G1403/1130," James said.

If more output is needed in the future, he can plug in a 1403-N1 printer, which prints 1,100 line/min, James added.

A universal character set feature of the 1403-2, -3 or -N1 also proved a great advantage over the earlier system, James said. The system has the capability of printing 240 characters instead of 48 with the older system.

This is an important feature for Overly, which uses its computer printer for a wide variety of functions. The universal character set also makes possible interchangeable type fonts.

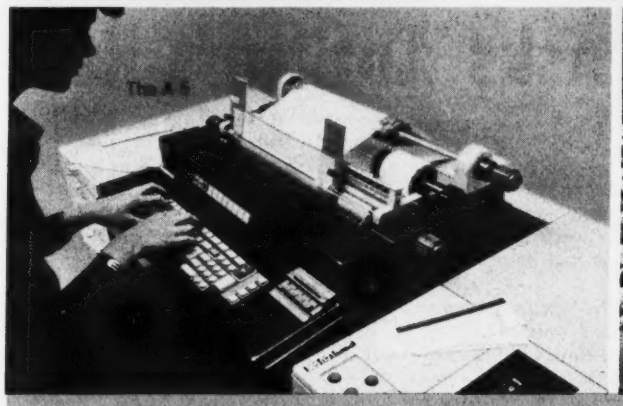
Overly had been leasing the 1403-6 printer and the multiplex-adapter unit for about $810/mo, James said. The printer controller cost $17,000 and he was able to buy a used 1403-2 printer for $10,000. The company will recover its expenditure in about 34 months, he added.

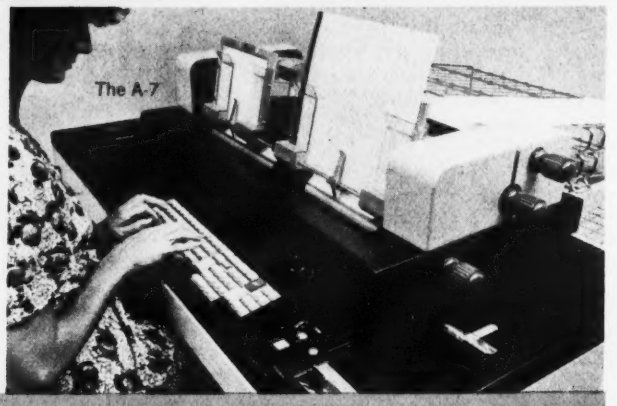
The G1403/1130 provided another benefit that is hard to measure but greatly appreciated by the company's DP Department, James said. The unit is about one-third the size of the IBM interface console, making available much-needed space in the computer room.

Overly fabricates a variety of custom metal products. It also uses its computer for a service bureau.

Because of its diversity, the company uses its computer printer for a variety of operations, some of which could not be performed with another type of printer, James said. For example, it prints mylar tags used by steel companies to identify products in stock.

In addition to accounting, inventory and other standard business data, the printer also produces design specifications, production instructions and parts and material listings. Print quality is a factor because the printer will produce letters, invoices and other external communications, James said.





One thing all our minicomputer systems have in common is uncommon modularity.

Our A-5 accounting system and our A-7 minicomputer as well as our TC-800 financial terminal all feature a degree of modularity that's nothing short of incredible in distributed data processing.

In each case, only the minimum basic components need be purchased. Then, as requirements increase, new modules, or peripherals, can be added on. This all but ends the expensive procedure of trading up to new and more expensive equipment while taking a painful loss on the old.

Of course, the advantages of our systems don't end with modularity.

Our A-5, for example, is designed and priced to ease small businesses into computerization.

Our A-7 minicomputer is ideal for diverse users, from wholesalers and distributors to funded organizations such as school boards and municipalities.

And our TC-800 financial terminal features its own memory. So no matter what happens to any of the computers it's tied into, the TC-800 can keep operating in an off-line mode as if nothing happened.

Is it any wonder that Olivetti is considered the most innovative maker of minicomputer systems in the world today?

olivetti

OLIVETTI CORPORATION OF AMERICA
500 PARK AVE., NEW YORK CITY 10022
ATTN: Systems Marketing

Okay,
Olivetti—send me more information on your distributed data processing systems.

NAME _____
TITLE _____
COMPANY _____
TYPE OF BUSINESS _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
PHONE NUMBER _____ CW-7

COMPUTER INDUSTRY

CI Notes

3M Miniature Cartridge Gets Hewlett-Packard Nod

CUPERTINO, Calif. – Hewlett-Packard Co. (HP) has selected 3M's miniature cartridge for incorporation in a range of products.

The unit is one-third the size of the previous 3M DC-300-A and contains 140 feet of .15-in.-wide tape that can accommodate densities of 800 bit/in., the firm said.

Transfer rate is 8,000 bit/sec at a tape speed of 10 in./sec. The unit's drive mechanism has one rotating part, with speed and tension kept constant by an elastic belt, HP said.

The mini cartridge will be used in data entry and acquisition and to store programs and data for minicomputers and terminals, HP said.

HP Wins New Zealand Pact

SYDNEY, Australia – Hewlett-Packard Co. (HP) has received a contract valued at about $3 million from the New Zealand Government State Services Commission for a total of 41 Management/230 computer systems and 192 Model 2640A CRT terminals.

The systems are part of separate terminal networks to connect 54 offices of the Inland Revenue Department and the Social Welfare Department with a central Burroughs B4700.

HP competed with 23 other suppliers for the order.

Bunker Ramo, Compata Collaborate

TRUMBULL, Conn. – Bunker Ramo Corp. and Compata, Inc. have agreed to combine efforts to develop, produce and market computerized on-line transaction processing systems for banks.

The systems will use Bunker Ramo's Bank Control System 90 teller terminal equipment in combination with Compata's central computer site program.

Overall system responsibility under any bank installation contract would rest with Bunker Ramo, the firms said.

Nonvolatile Semis Seen

CAMBRIDGE, Mass. – A Massachusetts Institute of Technology Ph.D. recipient has devised a nonvolatile semi-conductor storage element that can be integrated into a charge-coupled (CCD) structure.

MIT has applied for a patent on the invention of Laurence G. Walker, which is nonvolatile, accepts information at low voltage and can be erased by irradiation.

Work is under way to develop a memory array consisting of the elements developed by Walker.

Supershorts

Dataproducts Corp. has named Phoenix SRL (Rome) as its distributor in Italy for printers and memory products.

– – –

Sanders Data Systems has selected Data Terminal Systems SRL as its distributor in Italy.

– – –

GNT Automatic A/S of Copenhagen has been named distributor in Germany, the UK and Denmark of General Electric's Data Communications Products Department's Terminet 300, 1200, 120 and 30.

– – –

Beehive Medical Electronics, Inc. has delivered its 3,000th Super Bee 2 and its 1,500th Mini Bee 2.

– – –

Control Data Corp. is consolidating testing and stringing of core memories in Seoul, Korea, gradually phasing out Hong Kong operations.

Study Sees U.S. Major Market

'79 DP Shipments to Reach $18.9 Billion

By a CW Staff Writer

WALTHAM, Mass. – Worldwide computer shipments from U.S.-based manufacturers will grow from 77,400 units or $11.2 billion in 1975 to 185,900 systems or $18.9 billion in 1979, according to International Data Corp.'s (IDC) review and forecast issue of its *EDP Industry Report* (EDP/IR).

The largest annual increase in number of shipments should occur in 1976, when it rises to 112,800, the newsletter said.

Shipments in the U.S. will continue to account for more than half the totals, with 53,300 systems valued at $6.9 billion in 1975. In 1979, shipments will reach 128,000 systems valued at $11.24 billion, the report indicated.

The total installed base in the U.S. is expected to consist of 209,800 systems in 1975 and climb to 566,200 in 1979, the report said.

The values of these bases are estimated at $37.6 billion in 1975 and $60.2 billion in 1979.

International Scene

On the international scene, 1975 shipments should total 24,100 units valued at $4.27 billion and more than double to 57,600 units with a value of $7.68 billion during 1979, EDP/IR said.

The value of the international base is projected to rise from $23.2 billion in 1975 to $39.5 billion in 1979.

The biggest jump in the number of systems shipped in the U.S. and internationally is forecast to occur in 1976 compared with the 1975 figures.

From a base of 53,300 systems in the U.S. in 1975, the total will reach 78,000 units in 1976, the report indicated.

International shipments will grow from 24,100 units to 34,800 units in 1976.

The value of U.S. shipments is projected to grow annually during the next four years by about $600 million. The rise in value comes as a contrast to the drop experienced between 1974 and 1975, when the value of shipments in the U.S. dipped from $7 billion to $6.9 billion.

Forecasts by Category

Of the 77,400 units or $11.2 billion of total U.S.-made worldwide shipments during 1975, 17,400 units or $9.7 billion will be general-purpose computers.

There will be 60,000 units shipped in 1975 of the dedicated-application variety, for a value of $1.47 billion. IDC defined these machines as including most minis and special-purpose machines.

Although the 1975 value of general-purpose machine shipments is seen declining from the 1974 figure of $10.07 billion, the value of dedicated machines shipped will grow from $1.17 billion in 1974.

The value of dedicated-application shipments in the U.S. in the next four years will average an annual growth of $300 million.

Beginning at $1 billion or 41,700 systems in 1975, the shipment value of dedicated machines in the U.S. will reach $2.24 billion or 110,000 systems during 1979, EDP/IR said.

General-purpose shipments in the U.S., on the other hand, will have a less steady growth rate.

The 1975 shipments of $5.9 billion or 11,600 units will edge up $300 million in 1976, but will take off with a growth of $1.3 billion during each of the next two years.

The growth rate of shipments of general-purpose systems internationally over the four years will far outpace that in the U.S., jumping from 5,800 systems valued at $3.8 billion in 1975 to 12,600 shipments in 1979.

The 1979 unit shipments will go down from the 1977 figure of 12,700 units and the 1978 figure of 13,600 units. Value of shipments will continue to grow each year to $6.5 billion during 1979.

The big growth years in both number of general-purpose systems and value for the international market will be between 1976, 1977 and 1978, the report indicated.

By 1979, the installed international base of U.S.-shipped general-purpose computers will be $34.6 billion compared with a U.S. base of $48.8 billion.

In dedicated-application computers, the U.S. installed base will be more than double that of the international – $11.4 billion compared with $4.9 billion internationally.

Seeks More Effective Units

Biddle Asks Antitrust Reorientation

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Steps should be taken to reorient the federal law enforcement structure from "picking away at the indicia of monopoly power" to remedying monopoly structure and its performance.

In testifying before the Senate Subcommittee on Antitrust and Monopoly, Computer Industry Association (CIA) executive A.G.W. (Jack) Biddle set forth several suggestions to strengthen the Antitrust Enforcement Act of 1975.

The CIA endorses S. 1136, the Antitrust Enforcement Act of 1975, he said, noting the current budget for the Antitrust Division of the Justice Department and the Bureau of Competition of the Federal Trade Commission (FTC) is a per capita expenditure of six cents per year.

Under the legislation, the amount allocated would be raised to equal 40 cents per person; by contrast, the Senate recently authorized $138 per person to protect citizens from foreign aggressors.

"Is 40 cents too much to spend to protect these same citizens from those who would destroy our freedom of choice rather than face the rigors of free and equal competition? I hope the answer is no," Biddle said.

Under the bill, the Antitrust Division and the Bureau of Competition would each receive $25 million for fiscal 1976, $35 million for 1977 and $45 million for 1978.

The current allocation is $17 million for Antitrust and $12.5 million for the Bureau of Competition.

Suggestions for Income

Biddle suggested several means by which income to the departments could be ensured. Congress should take immediate steps to provide for the actual appropriation of the proposed funds, rather than merely authorizing them subject to later cuts, he said.

In addition, thought should be given to extending the life of the legislation, perhaps by legislating that, barring further congressional action, the authorizations for antitrust enforcement would be "automatically adjusted upward or downward in direct proportion to changes in the gross national product in constant dollars."

Instead of providing for an escalation between the Antitrust Division and IBM's legal forces, the CIA would like to see a "substantive improvement in the quality of the cases brought and a realistic reappraisal of the total antitrust enforcement process."

Among Biddle's suggestions on ways to effectively employ the increased appropriations were:

- Establishing industry experts on seven industrial sectors within the Antitrust Division, including personnel from

(Continued on Page 22)

CIA Endorses Antitrust Overhaul

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – "Unhealthy concentrations of economic power serve to undermine the workings of free markets for goods, capital, labor and ideas," A.G.W. (Jack) Biddle told the Senate Subcommittee on Antitrust and Monopoly here recently.

"Unhealthy concentration of any one of these ingredients essential to the workings of the free enterprise system can, we believe, lead to undue concentration of political power and in turn to an erosion of our free democratic society," the executive director of the Computer Industry Association (CIA) added.

Biddle admitted the CIA was probably "somewhat unique among business leagues" in its support for a Senate bill that would give the government a stronger hand in prosecuting antitrust cases.

The bill, introduced by Sen. Philip A. Hart (D-Mich.) and Sen. Hugh Scott (R-Pa.) and entitled the Antitrust Improvements Act of 1975 (S. 1284), is an overhaul of the antitrust laws.

Under the provisions of the bill, companies would be required to give notice to the government before merging, state attorneys would be able to file antitrust suits on behalf of citizens and penalties would be increased for violation of Federal Trade Commission subpoenas and other processes.

Three Tiers

In explaining why the organization supports the bill, Biddle indicated the CIA "includes a substantial portion of the viable business organizations that comprise what I might refer to as the third tier of the computer industry."

The first tier of the industry "consists essentially" of IBM, while the second tier is made up of the five to seven companies primarily involved in the computer systems marketplace, he said.

Altogether the second tier holds "approximately 30% of the general-purpose systems market, well behind IBM's approximately 70%," he added.

The third tier, he said, includes companies that have chosen to compete as specialty producers within the total market environment.

(Continued on Page 22)

Honeywell Projects Its Mini Business Up 58% Over '74

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – During 1975, Honeywell Information Systems' minicomputer business will be 58% ahead of 1974, which was a record year for the firm, said Al Kluesner, director of North American Minisystems, Communications and Subsystems Marketing Group at Honeywell.

The size of Honeywell's minicomputer business, although difficult to perceive because of internal reporting requirements, is larger than people commonly believe, he said.

Although Honeywell's share of the mini market has dropped from a one-time high of 7%, it is over one industry figure of 2.2%, he said. Honeywell, he noted, had underestimated the mini market in 1973 and 1974.

Total industry projections call for minicomputer sales to reach $3.1 billion annually by 1979, with $1.1 billion of that abroad, Kluesner noted.

He readily admitted Honeywell has somewhat ignored the importance of the minicomputer area until relatively recently, since corporate strategy had been devoted to effecting the GE merger and developing a unified product line.

However, after the 60 series was launched in April 1974, more attention has been paid to the mini area, he said.

As an indication of Honeywell's renewed interest in the mini area, the R&D budget for Kluesner's operation will be increased by about 400% this year, and the budget was up substantially last year over the previous year, he said.

Kluesner joked that the area he heads was once referred to internally as "novelties and notions."

But in the reorganization, minicomputers, communications and subsystems emerged as one of a triumvirate along with Phoenix, which is responsible for the large systems, and the small to medium group, which has the 2000 series and the 62, 64 and 61.

Asked about new products, Dennis J. Reardon, director of mini and communications systems product marketing, said the "mini we have works beautifully."

He did note there have been several software enhancements for the 716 in the past year, and added, "we're doing our homework."

Minis are the outstanding product line at Honeywell in terms of volume, Kluesner said.

Of the older line of 516, 416 and 316, 70% of shipments are to OEM systems builders and 30% to the end-user and communications-oriented markets.

But the 716, delivered in October 1972, reverses these figures, he noted.

The average shipment value of the 716 is $72,000, and the average order includes six systems, he said.

Kluesner mused whether the line between peripherals and systems houses on one side and minicomputer manufacturers on the other will become even more blurry as the race quickens for inexpensive peripherals gear.

He said in five years or less, 55% of the value of a system will consist of peripherals and 45% of mini and communications equipment.

Kluesner Sees Three Big Areas For Mini Market

BOSTON – Computer systems support with communications, distributed processing and networking functions are expected to account for about 30% of the worldwide mini market by value in 1977, said Al Kluesner, director of Honeywell's North American Minisystems, Communications and Subsystems Marketing Group.

The data monitoring and control area should account for about 40% of the mini market in 1977, he said, with free-standing mini data processing and data conversions systems occupying the remaining 30%.

Lee E. Sheehan, vice-president and general manager of Honeywell's North American Computer Operation, said many of the services and capabilities predicted for minisystems within the next few decades are technologically within reach.

Speaking at a recent conference on minisystems sponsored by Honeywell, he said such systems include optimized shopping services, intelligent terminal-equipped offices in the home and electronic communications as a substitute for meetings.

But economic, political and social concerns as well as technology will determine the degree of acceptance of minis, he said.

AUSTRALIA

Authentic information is freely available **WITHOUT CHARGE** from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

Frank Parish talks out of both sides of his mouth.

To other medical information systems' marketing guys who might ask, he says: Computerworld? Oh, yeah. Interesting paper. Horizontal coverage across the data processing business. Probably would have a lot of wasted circulation if you're trying to reach decision makers in hospitals. And anyhow, I'd guess the editorial content is aimed at people who are interested in big mainframes, and not dedicated minis like the Nova that makes *our* system work.

Conventional wisdom would probably dictate that tight ad budgets should focus on the verticals to reach the hospital administrators with your message, right?

To Computerworld, after running five ads in our paper, he says: We never gave your paper a serious thought for product advertising until we used you for a Help Wanted ad to find a top programmer. Paul Pease, our agency head, looked through the inquiries with me, and it was clear that your readers were the people we wanted to reach with our first product ads. So we gave it a shot.

The result? Lots of responses, and top quality, as well. The right job titles. At the right hospitals or consulting firms. I won't tell you all my secrets, because I'm sure some of the competition will read this. But we continue to use the paper.

COMPUTERWORLD
A vertical horizontal.

Frank Parrish, Vice President of Marketing, Spectra Medical Systems, Inc., Palo Alto, California. Spectra Medical has developed a medical information system which can handle all patient medical data *in real time*. I/O devices are four-color CRT data stations located throughout the hospital. Hard copy is via Versatec terminals. Cost of the system is in the $2-4/patient/day range. For more information about the system, call Frank at (415) 964-4630. For more information about **Computerworld**, call your local rep. He's listed in SRDS.

DOS/RS™

©1974 dearborn computer leasing co.

More run for your money

If you're running under DOS, we have a long list of enhancements to offer you in our DOS/RS (real storage) package.

It delivers six partitions—three regular batched, plus two SPI for teleprocessing, and one for Power II.

You have full relocatability, and complete support of all components.

Add to that seven control and performance statements that let you show where every penny goes, and you'll know why DOS/RS™ makes everything run better.

In computer management, that's what wins races.

For all the facts, call your nearest Dearborn office.

dearborn

dc dearborn computer leasing co. chicago (312) 671-4410
toronto (416) 621-7060 st. louis (314) 727-7277 cincinnati (513) 771-1277
Member Computer Lessors Association

Data 100 Plans OEM Mini Sales With Odec, Iomec Acquisitions

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Data 100 Corp. plans to enter the OEM arena for minicomputer systems, aided by its acquisitions of Odec, Inc. and more recently of Iomec, Inc. [CW, June 25], Bruce Bambrough, executive vice-president of operations at Data 100, explained.

Terms of the acquisition of Iomec have been announced and approved by directors of both firms. The transaction is subject to the approval of Iomec's 250 shareholders and certain creditors.

Iomec will be operated as a subsidiary, continuing its current product line and marketing strategies, Bambrough said.

The acquisitions serve a dual purpose for Data 100 – providing more complete vertical integration for electromechanical components as well as offering a diversified area for stability, Bambrough explained.

Data 100 makes the minicomputers, card readers and CRTs used in its terminal products and its demands for disks are increasing as the key-batch business grows, he said.

Although Data 100 currently uses neither Odec printers nor Iomec disks in its products, it plans to do so as soon as possible, he said.

Vertical integration of electromechanical equipment is becoming increasingly imperative since, with the decreasing cost of electronics, the gross margin of the future, if not the present, is going to center on electromechanical components, Bambrough said.

"There are no margins unless you make your own gear," he said.

These acquisitions fulfill Data 100's plans for vertical integration in the terminal product line, and Bambrough said he didn't know what would be next.

In addition to using Odec and Iomec products in its own systems, Data 100 will market its components to systems houses.

Bambrough extrapolated that the OEM market for mini systems in commercial configurations will be about $960 million worldwide in 1975, with 25% annual growth seen for the future.

"It's in growth opportunities that I think a small company can carve a niche, as opposed to trying to carve a niche at the expense of other vendors in an area that only has a 5% or 10% annual growth," he said.

The minisystems area seems to present the same "good opportunity that terminals represented to us six years ago. It wasn't very big at that time, but it looked as though it would grow anywhere between 25% and 40% a year, which it did."

Data 100 plans to capitalize on the advantages of its existing service organization in selling to systems houses, he said. The firm has about 450 maintenance personnel, he noted.

Bambrough expects the newly acquired peripherals sectors to contribute about one quarter of Data 100's revenues this year and to be as profitable in gross margins as the rest of the firm in three or four years.

Under the terms of the acquisition for Iomec, Data 100 would issue 80,000 common shares if all Iomec shareholders accept.

CIA Endorses Antitrust Overhaul

(Continued from Page 20)

"As such, they are sensitive to the problems of competing in a marketplace that evidences a monopoly or oligopoly structure," he said.

"The chief executives of our member companies are fully cognizant of the realities of competing on the merits in an extremely competitive marketplace. In many respects, they represent the personification of the American free enterprise system at work, since many were founders of their companies or represent second-generation management in rapidly developing high technology fields," Biddle said.

"They must compete effectively and they must compete within the strictures of established law and legislative mandate.

"At the same time they must maximize both their corporate growth and profitability, if in turn they are going to have reasonable access to the capital that is essential to sustain further growth," he added.

"This is especially true in the computer industry, since the dominant company within our industry has established rental of equipment as the prevalent means of doing business. As a result, ours is an extremely capital-intensive field," Biddle said.

The Antitrust Improvements Act of 1975 is but one of a number of constructive steps that are needed in our nation's efforts to seek ways "to correct the basic conflicts that now exist between what is perceived to be for the common good by many within our society and the objectives of the capitalist system as perceived by business management," he said.

By strengthening the ability of the Department of Justice to investigate cases of concentration and by providing for expedited treatment of antitrust cases, the bill would strengthen the government's hand against antitrust violators, Biddle said.

Antitrust Reorientation Sought

(Continued from Page 20)

marketing, engineering, manufacturing, product planning and accounting backgrounds.

- Establishing a similar unit in the Bureau of Competition, including personnel from the financial community, which would be available to assist federal district court judges during the relief phase of private Sherman-Clayton actions.
- Examining the rationale behind the existence of both the Antitrust unit and the Bureau of Competition.

Biddle suggested charging Antitrust with structural monopoly problems and the FTC with conduct problems or merging both into an entity answerable to Congress.

- Expanding and modernizing the two units' resources, including utilization of computers.
- Conducting a management audit of both entities because they need clearly defined goals and objectives and controls to assure maximum performance.
- Asking the units to "examine in depth how we might, over time, shift from an 'antimonopoly' posture to a 'pro-competition' posture.

"A searching examination of our tax, labor and banking laws, regulatory policies and procedures and numerous other aspects of our overall economic system would undoubtedly show that we are motivating the business manager to do the very things that we then indict him for under our antitrust laws.

"Is it any wonder that the whole process has become an adversary one?" he asked.

The beginning and the end of data communications

A special supplement onData Communications Terminals in the July 30th issue of Computerworld.

All data communications start and finish with data communications terminals. And you'll be reading all about them in our July 30th supplement. Edited by Ron Frank, this supplement will take an in-depth look at data communications terminals and their effective use in data networks. You'll see applications stories, tutorials and comprehensive articles on topics like these:

- **Batch vs. On-Line**
- **The Man-Machine Interface**
- **The right terminal for the right application**

If you have anything to do with data communications, you should be reading this supplement from start to finish. And if you're marketing goods or services in this field, your ad should be there. Ad closing is July 11th. Contact the *Computerworld* salesman in your area for details, or call Judy Milford or Sara Steets at (617) 965-5800.

COMPUTERWORLD

National Sales Office
Neal Wilder
Dottie Travis
(617) 965-5800

Boston
Bob Ziegel
Mike Burman
(617) 965-5800

New York
Don Fagan
Frank Gallo
(201) 461-2575

San Francisco
Bill Healey
(415) 495-0990

position announcements | position announcements | position announcements | position announcements

PERSONALS

Am trying to locate Michael A. Luciano, Jr. former systems analyst and programmer for General Electric Computer Department at Los Angeles, California 1968-1969. Please Contact:

Marvin Reznick
P.O. Box 54812
Los Angeles, Ca. 90054
or
Phone (213) 587-2251 Collect

POSITION ANNOUNCEMENTS

COBOL APPLICATION PROGRAMMER

Opportunity available immediately with major retail food chain in Atlanta. We have an IBM 370/145 VS System with 3330 disks and teleprocess to divisional Model 20's. ANS COBOL main language. Candidates should have 2-4 years commercial programming experience.
Position offers growth opportunity, good starting salary with excellent fringe benefits. Degree candidates preferred. Send resume and salary requirements to: J. R. Crews

Colonial Stores Incorporated
Box 4358 Atlanta, Ga. 30302
(404) 768-4611

An Equal Opportunity Employer M/F.

Division Systems Manager

Career opportunity with Fortune 200 corp; located in desirable New England area. Our client seeks experience in below listed areas:
1 - Distributor on line order entry
2 - Plant monitoring and shop floor control systems
4 - Integrated Data Bases.
Leadership ability is important, plus ability to communicate and achieve results. Ideally you should have 10-15 yrs D.P. exp., with a minimum of 5 yrs Management background. Starting salary to $28,000, plus outstanding benefit package and our search fee paid. Contact S.J. Burns (215/561-6300), Fox-Morris, Personnel Consultants, 1500 Chestnut Street, Philadelphia, PA 19102.

ROBERT HALF PERSONNEL AGENCIES

of Los Angeles of Orange County

PROJECT MANAGER

Install RJE terminals to regional Data centers. Must have exp. in VS1 RJE & exp. in retail industry. First year in Dallas then move to Los Angeles. Salary to $28,000.

SYSTEMS PROGRAMMER

Applicants must have strong IBM OS VS (1 or 2), IMS, TSO exp plus light CDC Scope or Kronos plus Compass. Relocate to smog free suburban Southern California. Starting Salary to $25,000.

Client company pays all fees
Phone or Write Duncan White
(213) 386-6805

Los Angeles Suite 1914
3600 Wilshire Blvd. L.A. 90010
Orange County Suite 501
P.O. Box 1650 Orange, 92668

PROGRAMMER ANALYST

MANAGEMENT COUNSULTING

The Chicago office of a big 8 international CPA firm seeks a competent Programmer/Analyst to join its Systems and EDP consulting staff. Qualified candidates should be degreed and have 2 or more years experience including COBOL programming for IBM 360 or 370, use of OS software and emphasis of on business and information processing applications. Current salary should be in the mid teens range.
For the independent self-starter type of person we offer the opportunity to develop into a broad range EDP Consultant involved in a variety of applications and industries including design and implementation of on-line systems.
Compensation and benefits are excellent. If consulting in a professional environment appeals to you, sned your resume or letter, including salary history, to:

Mr. Ray Pasini
CW Box 4396
797 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer M/F

SYSTEMS ANALYSTS

We are a wholly owned subsidiary of a bank holding company located in a medium size Midwestern city. We have immediate openings for experienced systems analysts capable of assuming project management responsibility for the design and implementation of sophisticated banking systems. We would prefer, but do not require, that candidates have a college education and experience with IBM teleprocessing systems. A sound knowledge of banking applications is required. We offer a challenging environment, an excellent benefit program, and a salary commensurate with your ability. If you are interested, please forward your resume in confidence to:

CW Box 4393
797 Washington Street
Newton, Mass. 02160

FIELD SERVICE ENGINEER

We are seeking an experienced field service engineer with strong background in GE 400 systems. This engineer must be capable of maintaining a large end-user site with minimum supervision. Selected candidate must be proficient with GE 400 and related peripheral equipment. Technical school graduate with at least 5 years experience in field service.

Please send resume and salary history to:

Talman Federal Savings & Loan Association
5501 South Kedzie Avenue
Chicago, Illinois 60629
Attention: Placement Manager
An Equal Opportunity Employer M/F

OUTSTANDING OPPORTUNITY FINANCIAL SOFTWARE SALES

Sell the World's #1 Financial Reporting Software Systems.

Territories available:
N.Y. Cleveland Chicago Philadelphia Southeast

If you have a successful track record and sales experience to IBM 360/370 users, we have a position offering top earning potential and excellent benefits. Reply in confidence to D.K. Lane, Vice President, Marketing.

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810 (617) 475-5040

DATA PROCESSING MANAGER

Challenging opportunity exists in a 250 bed general hospital in Wisconsin's Fox River Valley. The successful candidate will be an experienced data processing manager with abilities to establish a Data Processing Department and install an NCR computer system. Experience with NCR computer systems desirable, with experience in a hospital preferred. Send resume and salary requirements to:

W.L. Edwards
Director of Finance
Appleton Memorial Hospital
1818 N. Meade St.
Appleton, Wisconsin 54911

EDP Men & Women

A Golden Opportunity

You can earn thousands of extra dollars while still retaining your present position by selling computer ribbons, computer tapes and typewriter ribbons. Manufacturers pay commissions each month. Terrific repeat business. Write to:

CW Box 4374
797 Washington St.
Newton, Mass. 02160

Computerworld Classifieds could hold the key to your next office.

PROGRAMMERS & PROGRAMMER ANALYSTS

Immediate openings for experienced individuals with COBOL, PL/1, IMS, TOTAL, CICS, OS and/or OS/VS experience.

Call Collect or Write:
Mr. Cliff Taylor (214) 243-3421

CUTLER-WILLIAMS, INC.
2655 Villa Creek Drive, Dallas, Texas 75234
An Equal Opportunity Employer M/F

PROGRAMMER/ANALYST PROGRAMMER

We offer a modern facility with a good working environment utilizing an IBM 370/145 with DOS/VS. COBOL is our standard language.

W have an immediate need for Applications Programmers to develop on line and batch programs for a diversified group of client companies.

*Programmer/Analyst – an individual with 3-5 years of programming and/or systems work.

*Programmer – should have 1-2 years of programming experience.

You will participate in a liberal benefit package, including profit sharing. Relocation expenses will be paid.

Please submit your resume with salary history in confidence to: W.H. Williamson, V.P. Personnel.

Celina Group
Insurance Square Celina, Ohio 45822

STATE OF ALASKA

Needs EDP programmers for its rapidly expanding facilities: IBM 370/145 and IBM 360 environment.

Requires minimum one year business or government programming experience, BAL or COBOL preferred. Starting monthly salary $1,361 and $1,578 depending on qualifications.
Interviews will be arranged in various locations during July.

Send resumes to Peggy Zufelt, Recruitment Coordinator, Pouch C, 1001, Juneau, Alaska 99801.
an equal opportunity employer m/f

systems professionals

Realize growth and challenge in a dynamic and expanding state of the art environment. Join the analyst staff of one of the country's largest financial institutions. Involvement is wide ranging – you'll be working on new technolgoy systems supported by two 370/168's under OS/VS, CICS, TCAM Video 370, supporting large terminal networks – with front end processors. Immediate openings include:

JR. ANALYST

Salaries low-mid teens
2-3 years EDP experience
Less than 1 year analyst exp.

SYSTEMS ANALYST

Salaries mid-teens
2-5 years EDP experience
1-3 years experience in new development as an analyst

SENIOR ANALYST

Salaries mid to high teens. 3 years plus experience as an analyst. At least one year telecommunications.

Our managers are developed from within, and there are ample opportunities to move into various specialized systems functions and/or the more traditional banking roles. Previous banking experience is not required. Degree preferred. For immediate consideration call collect (312) 828-6495 or send resume and salary history in confidence to:

Mr. Bill Hammond Professional Placement

CONTINENTAL BANK
231 S. LaSalle Street
Chicago, Illinois 60693
An Equal Opportunity Employer

position announcements | position announcements | position announcements | position announcements | position announcements

MANAGEMENT SYSTEMS

World's largest producer of electric submergible pumps has immediate openings for experienced Data Processing Professionals. The Management Systems Department reports to the President and is responsible for MIS Development in all areas of the company. IBM 360 or 370 DOS is essential. Assembler language training, DOMP experience and CICS experience preferred. Attractive compensation and benefits package.

SYSTEMS ANALYSTS

Must have a minimum of 3 years programming plus 2 years systems analysis in a functional area of a manufacturing company. A related college degree is required.

PROGRAMMERS

Needs 2 years programming in a manufacturing environment, 1 of those years devoted to a functional area. A related college degree or technical school certificate is required.

Send Resume to:

TRW REDA PUMP COMPANY
Supervisor of Employment
Bartlesville, Oklahoma 74003
Equal Opportunity Employer M/F

PROGRAMMERS

EDP PROG. ANALYST I
$1277 to $1506

This positon requires one (1) year experience in programming and coding at the level of EDP Asst. Prog. Analyst.

Please apply in person at:
LOS ANGELES COUNTY
Hall of Administration
222 N. Grand Ave., Rm 493
Los Angeles, Ca.
(213) 974-2791
Open to men and women
Equal opportunity employer

PROGRAMMER

Boise, Idaho

Ore-Ida Foods has an immediate opening for a business programmer to work with a 370 DOS/VS installation. Opportunity to assist in systems design. Applicants should have a minimum of 2 to 3 years experience with a working knowledge of COBOL, ADPAC or Assembler language. Some college and exposure to video equipment desirable.

This growth position offers competitive starting salary, liberal benefits package and relocation. Send complete resume including salary history and requirements to Phil Toomey, P.O. Box 10, Boise, Idaho 83707.

Ore-Ida Foods, Inc.
An Equal Opportunity Employer M/F

SOUTH FLORIDA PROGRAMMERS

Relocation Assistance Provided

Milgo Electronic Corporation, one of South Florida's leading growth companies, has career positions available for programmers. We can offer you excellent salaries, complete company benefits, ideal growth environment, and relocation assistance.

Applications Programmers

This position requires 2 - 4 years experience in COBOL applications programming. Applications should include both manufacturing and accounting systems.

Systems Programmer

Applicatns should have 2 - 4 years experience in System programming using assembler and COBOL languages.

To arrange for your interview, send your resume in complete confidence to Dan Haynes.

MILGO ELECTRONIC CORPORATION
8600 N.W. 41st Street, Miami, Florida 33166
Equal Opportunity Employer

SYSTEMS ANALYSTS

THE GAP STORES, INC., a nationwide retail specialty chain, has several openings for Systems Analysts in the MIS Division. Must be able to analyze and design ongoing management processes as well as develop and present systems proposals. Requirements include B.A., preferably MBA, and 3 – 7 years experience in Management Information Systems. Salary commensurate with ability. Excellent benefits. Send resume, with salary history, in confidence to:

The Gap
875 Mahler Road
Burlingame, CA 94010
An E.O.E.

NCR

A Growing Place for Professional People

NCR's Retail Systems Division in Cambridge, Ohio has an immediate opening available for a computer applications analyst. We are growing because of our basic approach to people. We believe that you are an individual and that career paths should reflect your individual potential. At RSD you have the opportunity to continue your professional career, to pursue your own special interests and to use all your background and experience because we offer an ever-growing diversity of professional opportunities.

COMPUTER APPLICATIONS ANALYST

To provide programming support and consultation to various engineering groups engaged in computer program development and/or in the utilization of operational computer programs and systems. Will also perform computer program implementation, maintenance, modification and documentation as required.

BS degree in Computer Science or Engineering plus 2-5 years in application programming of which some 1-3 should include the design automation area. Experience should include some assembly language programming as well as higher level languages. Experience must include recent experience with CDC CYBERNET System operating under SCOPE batch and/or KRO/NOS interactive time sharing operating system.

This position represents a substantial and challenging opportunity for you to extend your professional career. So why not grow along with us.

Send resume including history and salary requirements in complete confidence to:

Jan S. Leftwich
Professional Placement
Retail Systems Division
NCR Corporation
Box 728
Cambridge, Ohio 43725
(614) 439-0289
An Equal Opportunity Employer

A trip for two to Latin America.

We're Data General, one of the world's fastest growing computer manufacturers.

Right now we're busy growing in Latin America. And we need two more good people to help.

So if you're knowledgeable enough in computers to make the right decisions and forceful enough to carry them out, give us a call.

You could be the lucky winner of one of our terrific jobs.

Field Engineering Manager

You will assume responsibility for establishing, staffing, and managing field engineering operations which will provide computer hardware support to our customer base in Latin America.

Qualified candidates will have 3-5 years field engineering management experience, plus a minimum of 5 years extensive hands-on experience with computer systems, including all standard peripherals (mag tape, discs, etc.).

You must be bilingual in English and Spanish or Portuguese; a BS degree in a technical discipline is desirable.

Systems Engineering Manager

We need a top level systems professional to assume responsibility for establishing, staffing and managing our systems engineering operations in Latin America.

Qualified candidates will have 3-5 years line management experience, extensive experience in real-time disc operating systems, and a heavy applications software background. You must be bilingual in English and Spanish or Portuguese; a BS in a technical discipline is highly desirable.

Both positions will require relocation to Latin America. If you are interested, call Don Bateman collect at (617) 481-5160, or send your resume to his attention at Data General Corp., Route 9, Southboro, Mass. 01772.

Data General

An Equal Opportunity Employer M/F

COMPUTER FACILITIES MANAGER

The Plasma Physics Laboratory is a directed research arm of Princeton University funded by the U.S. Energy Research and Development Administration, and is engaged in a rapidly expanding program of Controlled Thermonuclear Research (CTR). To facilitate an expanded effort in computational physics, aimed at developing large computer codes describing plasma dynamics, a KI DEC-10 system will be installed at Princeton as part of a new National CTR Computer Network, and will act as a Remote Job Entry Terminal to a new CDC-7600 computer in California. A Facility Manager is required immediately for the Princeton installation to supervise a small staff of systems programmers and operations personnel, to provide user services to computational physicists, and to coordinate in plans for the future development of the network. Background must include supervisory experience in a user-oriented scientific computer facility, and should include familiarity with DEC-10 systems, and with peripheral data processing equipment. Write Dept. C-11.

COMMERCIAL PROGRAMMER

This position requires a minimum of 4 years experience and working knowledge of both PL/1 and COBOL. Duties will include converting 360 PL/1 to PDP-10 COBOL, maintaining accounting programs and working on new interactive management system. Database and inquiry system experience would be helpful. Write Dept. C-12.

Benefits include 1 month vacation, group life and major medical insurance, tax deferred fully vested retirement, etc. The laboratory offers an attractive working environment, and a chance to participate in a research area of growing national importance.

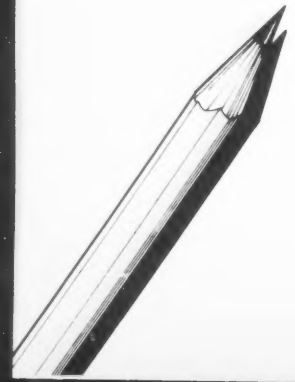
Send resume & salary requirement in confidence to Personnel Office. Please refer to Dept. Number.

PRINCETON UNIVERSITY
PLASMA PHYSICS LABORATORY
PRINCETON, NEW JERSEY 08540
An equal opportunity/Affirmative action employer

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

Use the attached order form and this envelope for:



- **A new subscription**
- **New address**
- **New Title**
- **New Industry**

Order form is attached through binding. Be sure to include current label or label information when making a change.

First Class
Permit No. 40760
Newton
Mass.

BUSINESS REPLY MAIL

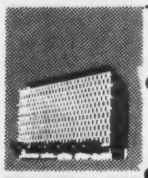
No postage stamp necessary if mailed in the United States

Postage Will Be Paid By

COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160

CIRCULATION DEPARTMENT

position announcements | position announcements | position announcements



•SENIOR SYSTEMS PROGRAMMER

•PROGRAMMER A L C

NBD has key openings in systems support and on a major on-line banking project. The environment is 370/168's under MVS and a TP network using CICS/VS and IMS. Applicants should have at least 2 years of experience and a record of success. A college degree is a plus, and the C.D.P. will be given consideration.

These positions offer a liberal benefits and salary plan, in-house training, and career growth potential. Send your resume and salary requirements to:

Kathleen M. Pfeiffer
Personnel Department
National Bank of Detroit
611 Woodward
Detroit, Michigan 48226

An equal opportunity employer m/f
We Hire the Handicapped

NBD

An equal opportunity employer

IMS? COBOL? East Coast & Detroit.

If you are a programmer or programmer/analyst with 2-5 years experience in commercial applications of IMS, COBOL, CICS or DL/1, Keane would like to talk with you.

We have openings in our Boston, Hartford, Westport, New York City, Northern New Jersey, Philadelphia and Detroit offices.

Keane is one of the nation's largest applications systems developers, with a client base in excess of 300 companies.

Our working environment and salary, benefit and professional growth programs are the best in the industry. Send your resume to Barbara Kenyon at our home office.

Keane: The software professional's career path.

KEANE ASSOCIATES, INC.
36 Washington Street, Wellesley Hills, Mass. 02181

T.P. SPECIALIST

New opening for Systems Pro with T.P. design & installatn exp. Should have lrge scale IBM OS/VS internals with BTAM, QTAM, TCAM knowl. Network design, terminal selection and TCU exp is pref'd. Salary to $20,000 (fee paid).

Contact Stan Durbas
ROBERT HALF PERSONNEL

ROBERT HALF PERSONNEL AGENCIES
111 Pearl St.
Hartford, Conn. 06103
(203) 278-7170

DATA PROCESSING

Our Pittsburgh clients need the following:

MGR DIV SYSTEMS to $30K
Proven managerial ability, heavy fab. & assembly mfg. exp., and a large-scale IBM systems background.

MFG SYSTEMS . . . to $20K
Several openings to head up projects in the Std. Cost, MRP, Inventory and Production Reporting areas. OS COBOL exp. helpful.

SYST PROGR . . . . . to $20K
Several openings for 2 yrs experience with 360/370 OS/VS Sysgens, T.P. & Data Base. Intercom particularly helpful.

Please forward resume and salary history in strictest confidence to:

COMPUTERPEOPLE, INC.
1704 Allegheny Towers
625 Stanwix St.
Pittsburgh, PA 15222

DIRECTOR COLLEGE COMPUTER CENTER

Immediate opening for Director of Data Processing (Coordinator of ADP Services) in large multi-campused suburban Community College in Washington, D.C. area. Ability to manage a 370/135 DOS/VS installation and its staff. Master's degree plus five years computer experience. Require experience in the management of a computer center and a sincere desire to service the educational user's needs. Closing date July 15, 1975. Send application to: Dean C.W. Shuler, Northern Virginia Community College, 8333 Little River Turnpike, Annandale, Virginia 22003. An Equal Opportunity/Affirmative Action Employer.

UNIVERSITY ADMINISTRATIVE APPLICATIONS

The University of Chicago Computation Center has immediate openings for a manager of systems and programming, a senior programmer/analyst, and programmer/analysts in the area of library data management system, student information systems, accounting systems for the university and business systems for the university press. The Computation Center provides data processing services to both administrative and academic users. New systems will be designed to employ the interactive and data based system software supported on the university's S370/168 operating under OS/VS2. Implementation effort is eased through TSO and other utility software available to the programming staff.

MANAGER, SYSTEMS AND PROGRAMMING

The University of Chicago Library is implementing automated systems in the areas of acquisitions, cataloging, and circulation control. Challenging position as manager of a staff of from four to eight programmer/analysts and senior programmer/analysts with responsibility for systems design and implementation of a wide variety of library processing applications. Candidates must have bachelor's degree, minimum of two years systems and programming management experience, at least four years systems analysis and programming experience in an OS/MVT or OS/VS2 environment. On-line data base system experience highly desirable.

PROJECT LEADER

Major student-related administrative activities of the University require an advanced student information system. The position requires experienced senior programmer/analyst capable of planning, organizating and coordinating design through implementation efforts of system combining data base, interactive and batch technology supporting main student-related applications. Minimum experience required: supervision of a major system from requirements definition through implementation; 4 years system analysis and programming in OS/MVT or VS2 environment. On-line data base system experience in student information systems highly desirable.

PROGRAMMER/ANALYSTS

Openings exist for new systems development and expansion of existing systems in various application areas, e.g., order processing and inventory control for university press, financial and accounting systems for Comptroller, campaign fund processing for Development Office, in addition to the areas mentioned above. Requirements: 2-3 years programming experience in COBOL or PL/1 and 1 year systems analysis experience. Experience with applications mentioned or on-line or data base system desirable.

The University offers full benefits, competitive salary and a challenging growth opportunity. SEND RESUME ONLY with salary history and requirements to:

MR. LOUIS J. ROSE
The University of Chicago
956 E. 58th Street
Chicago, Illinois 60637

An Equal Opportunity Employer M/F

BUY SELL SWAP

BUY — SELL — LEASE — TRADE

IBM COMPUTERS — 1401's, 360/20's, 30's, 40's, 50's and 65's 370's, and System 3's. All peripherals.
UNIT RECORD — All models available under IBM M/A.
FOR LEASE — One Year Rates/Month 2311's—75.00 Net, Net 2841's-50.00 Net, Net 1401 Systems From 500.00 Net, Net

LONGHORN COMPUTER LEASING CORP.
3131 Turtle Creek Blvd. (222)
Dallas, Texas 75219 (214) 522-3170
Member Computer Dealers Association

WANTED
IBM 2415
1600 BPI
TAPE UNITS & CONTROL
PAUL VAJDIC
2900 Power & Light Bldg.
Kansas City, Mo. 64105
(816) 221-0188

IBM
UNIT RECORD EQUIPMENT
Buy – Sell – Equity Lease
026 056 082 077 514 552 402
029 059 083 085 519 548 407
Also Other IBM Punch Card Equipment.
1620 & 1130
Components or Systems
Guaranteed Eligible for IBM M/A
Immediate Delivery
Payment Plans to fit your Budget
CALL COLLECT
CMI Corporation
23000 Mack Avenue
St. Clair Shores, Michigan 48080
(313) 774-9500
TWX 810-226-9708
Member Computer Dealers Assoc.

FOR SALE 360/30
256K CORE 1.5 MS

Avail. Nov. 15, 1975
Two Selector Channels
Decimal/Float. Point Arith.
Interval Timer/Stor Protect
1051/1052 Consol
16K IBM Core, 240K CHCS Core

Sale by Owner, Make Offer to
CW Box 4397
797 Washington St.
Newton, Mass. 02160

FOR SALE
TELETYPE
MODEL 35
ASR KSR RO

Friction or Sprocket
All Fully Reconditioned
Call (201) 529-3939
or Write CW Box 4346
797 Washington St.
Newton, Mass. 02160

360/40 G00
Decimal Arithmetic
Floating Point
2 Channels
Storage Protect
1052 Printer Keyboard
Available for a
Short Term Lease
CALL, TELEX or WRITE
SUMMIT COMPUTER CORP.
480 Morris Ave.
Summit, N.J. 07901
(201) 273-6900 Tlx 13-8594
Member CDA

FOR SALE

SDS 940 systems in a variety of configurations ideal for scientific and educational applications. Spare parts, peripherals and communication equipment are available with these systems. All systems are now operable in a time-sharing environment.

For Information contact:
J.W. Caravello, Jr.
100 Wilshire Blvd. Ste. 450
Santa Monica, CA 90401
(213) 451-2982
TWX 910-343-7420

For Sale Or Lease

1412-001 S/360 Adpt.
1403-2 Printer for 360
65-128K Core Box
2403-6 Tape Controller & Drive
7-9 Track Compatible
6 MAI Mod 6 tapes

To Buy-Sell-Lease
Call Collect or Write:

Computer Systems/ Graphics, Inc.
2017 W. 104th St.
Leawood, Kanasa 66206
(913) 649-2190

Member Computer Dealers Assoc.

WANTED
I.F.A.

Integrated File Adapter to rent or lease for 370/135 System to accommodate 3330 or 3340.

Contact:
TIMES SQUARE STORES CORPORATION
T.M. Bier, Vice President
104-01 Foster Avenue
Brooklyn, N.Y. 11236
(212) 272-9600

FOR SALE by Owner

IBM Sys 3/10

32K, DPF, 3411 Tape Att; 5424 MFCU, 5444 Disk - 4.9 Meg, 5445 Disk (2 drives); 5471 Printer Keyboard, N1-1100LPM Printer.
SAVE on Purchase
Available Nov-Dec, 1975

Write CW Box 4395
797 Washington St.
Newton, Mass. 02160

We Buy & Sell
Burroughs L Series
Nova, DEC, Basic IV,
minis & peripherals
NCR Equipment

SALE
Centronics printers
Model 101, Model 102A

Boynton Business Systems
Box 87208
Wallkill, N.Y. 12589
(914) 895-3369

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

UNIVAC 1106

FOR SALE OR LEASE

1106 Processor	From 3,600 per month
131K Unitized Storage	3,200 per month
9300 8K Sys. with ICCU	440 per month
0768 H.S. Printer	700 per month

THE AMERICAN COMPUTER EXCHANGE
29525 Chagrin Boulevard
Cleveland, Ohio 44122
(216) 464-3881

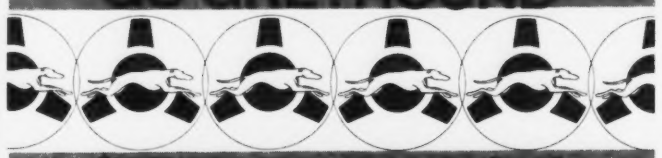
FOR SALE FOR IMMEDIATE AND FUTURE DELIVERY

16K 9300 3 VI-C	858-99 subsystems
32K 9300 4 VI-C	858-14 slaves
768 1100 LPM printer	8414 disks
64K 9400	8411 disks
131K 9400 Uniservo	12 tapes
131K 9480	

Member Computer Dealers Association

L&A Computer Industries, Inc.
Fox Hill Office Park • 10955 Granada
Overland Park Ks 66211 • (913) 381-7272

BUYING OR SELLING GO GREYHOUND



is available to assist you rapidly in buying, selling, trading, or leasing computer equipment. Just call:

New York	Dick Ventola	(914) 949-1515
Chicago	Pete Ahern	(312) 751-5430
Dallas	M. W. "Bill" Tucker	(214) 233-1818
Phoenix	Tom Takash	(602) 248-5978
San Francisco	Henry Paulson	(415) 989-4023

DATA ENTRY SALE

RECONDITIONDED MACHINES

026 Keypunch	$1,000.00
029 As Low As	1,500.00
Lear Siegler (NCW)	995.00
Decwriter-TWX-Telex	Available
Teletype ASR 33	925.00
Teletype ASR 35	1,800.00

We Buy-Sell-Rent Teletypes, TWX, Telex, Terminals and Punch Card Equipment
DATA RENTALS/SALES INC.
2919 S. LaCienega Blvd.
Culver City, Calif. 90230
(213) 559-3822

MINI-COMPUTER WORD PROCESSOR

HIGH SPEED, CUSTOM PREPARED LETTER OR DOCUMENT WRITING

With the mini-computer, words can be stored, edited, erased, justified, skipped, retrieved, indexed, or printed at maximum rate.

ATTRACTIVE PRICE - INCLUDES:

DEC 8E Minicomputer with 24K of Memory
Teleype Console
DEC RK05 Disk Controller with 3 DRives: 7,200,000 chars
Mohawk Data Science 210 LPM Printer (Upper & Lower Case Type)
4 Video Typing Stations
3 IBM Selectric Typing Stations
COMPU - Text Word Processing System

WESTINGHOUSE ELETRIC CORPORATION
Symphonette Square
New Rochelle, New York 10810
Phone: (914) 576-1000 (Ext. 2530)
Attention: Mr. R.M. Schwartz

FOR SALE

IBM Model 745 Heavy Duty I/O Printers

Have factory new heavy duty I/O printers for sale at attractive discount price. Immediate delivery.

Write CW Box 4398
797 Washington St.
Newton, Mass. 02160

WANTED

D-G 'RDOS' System*
24K, 2.5 Disk
2 CRTs, & printer
M/A Guarantee
*substitutes considered
Hamilton & Co., Mfg. Engrs.
655 Highland Ave. NE
Atlanta, Ga. 30312
(800) 241-8632

1401 SYSTEMS

1 Year Lease-Net, Net

4K System	$500/Month
8K System	$700/Month
12K System	$900/Month
16K System	$1100/Month

Longhorn Computer
3131 Turtle Creek
Suite 1222
214-522-3170
Dallas, Texas 75219

Sale or Lease

360/20

DISK SYSTEM

(interpret, 120 print positions)

Computer Resale Exchange, Inc.
1737 DeSales St. N.W.
Washington, D.C. 20036
(202) 737-1401

Member Computer Dealers Association

For Sale or Lease
2 — 360/50's H, I
plus peripherals

MODEL 40 TELETYPES
Sale: 370/165 K
Wanted: 360/65 J
370/145 H

American Computer
Sales & Leasing, Inc.
Suite 1333
440 Park Ave. South
New York, N.Y. 10016
(212) 689-7051

FOR SALE
MINI-COMPUTER EQUIPMENT
Used & Like New

• PDP/11-20 Incl. 24K memory, mntg box, rack, TTY & Interface, Lg. Syst. Cap. • PDP-8L Incl. 4K, TTY & Interface. • MM11E DEC 4K memory stack • Digitronics reader (2540) • PR-11DEC reader • MM11L DEC 8K memory stack • ASR 33 TTY 3320-3JC • TEK 601 scope • TA-11 dual DEC cassette • TC-11 DEC tape unit • ME11A DEC memory extension box, Incl 8K • KE11A DEC Exten. Arith. Element.

Call or write
Barry Atsatt or Ed Clark
1050 E. Meadow Circle
Palo Alto, CA 94303
(415) 494-7000

FOR SALE

360/50 100
2 Channel August
360/50 H00
2 Channel September
Available Now For Lease
1403-N01 + 2821-001
Wanted
IBM 370/145's and 370/158's On TLP

Call:
George S. McLaughlin
Associates, Inc.
480 Morris Ave
Summit, N.J. 07901
(201) 273-5700
Member CDA

MAGNETIC TAPE FOR SALE!!!

Recertified 100% Guaranteed Trouble Free

1600 BPI 2400 feet
3200 FCI 9 track - $5.47

800 BPI 2400 feet
full width tested - $4.97

Seals or thin line canisters

Call Miss Joan
(703) 339-7050

Precision Methods Inc.
8825 Telegraph Road
Lorton, Virginia 22079

FOR SALE

Twelve 3340-70 disk packs used less than one year.

Contact:
John Pilkington
Heckman Bindery, Inc.
1010 North Sycamore St.
North Manchester, Indiana 46962

ACS

WANTED
IBM 029
KEYPUNCHES
FOR SALE
8K & 12K 1440
DISK SYSTEMS
7335 TAPE DRIVE
FOR 1440 SYSTEM
Member Computer Dealers Assoc.

ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Tx 77055
(713) 461-1333

WANTED

BURROUGHS
L SERIES

TC 500, TC 700
NCR 31, 32, 41, 42
481-482

Basic 4 and Philips Systems
IBM Composers

Call Stuart Rubenstein
I.O.A. Data Corp.
383 Lafayette St., N.Y. 10003
(212) 673-9300
Member Computer Dealers Assoc.

One Westinghouse, 15 ton computer room air conditioning unit for raised floor installation. Including a gly-clo condenser for year round operation. Model No. UK 180 WIS.
No reasonable offer refused. Call Mr. Black for further information at (617) 731-2272.

FOR SALE

L7500-501
Burroughs Magnetic Computer with A9161 Auto Reader. Programmed for wholesale distributor. Three years old, either take over remainder of lease for 24 months or $16,500. Call Joe Devine, Milford, NH (603) 673-4967.

IBM 029-B12
IBM 029-B22

Guaranteed Eligible for IBM M/A. Several Systems Available Immediately.

CMI Corporation
23000 Mack Avenue
St. Clair Shores, MI 48080
(313) 774-9500
TWX 810-226-9708
Member Computer Dealers Assoc.

SELL LEASE

360/20

WITH	OR
1403-	2203
2560-1	2560

Sub Model 2 or 5
Bi-Synch, Disk, Tape
Available Immed.
Largest Owner of 360/20's

I/O Sets
Free Estimates
029, 059, 083, 084

Simplicity Computer Corp.
1600 Broadway
N.Y., N.Y. 10019
(212) 541-6340

BUY TRADE

IBM DEAL SPECIALISTS

168	165	65	Memory
158	155	50	Disk
145	135	40	Tape

I/O Sets Features
We buy/sell/lease anywhere in the world

CIS Corporation
Midtown Plaza
Syracuse, N.Y. 13210
(315) 474-5776
Telex 93-7435

CIS Europe, S.A.
80 Chaussie do Chareroi
1060 Brussels, Belgium
02-538-90-93

CONTINENTAL INFORMATION SYSTEMS CIS CORPORATION

Member Computer Dealers Association

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

UNIT RECORD DEALS.

Don't Make One Without Calling Us

1. No one (except IBM) has a bigger inventory
2. All types—instant delivery
3. Reconditioned, as is, or certified for IBM M. A.

BUY, SELL, SWAP

Call Warner Rivera at (212) 557-3712

GENESIS ONE COMPUTER CORPORATION
300 East 44th Street, New York, New York 10017
A subsidiary of Management Assistance, Inc. (MAI)

WANTED

ALL 360 SYSTEMS

360/30 360/50 1440 2311 360/25 360/20 360/40

CORPORATE COMPUTERS, INC.
115 Mason St., Greenwich, Conn. 06830 (203) 661-1500
Member Computer Dealers Association

370/158 2 meg

Features		AVAILABLE	For lease by owner
1433	8740	Oct. 1, 1975	3 year — $42,000/mo
1434	9043	Please reply to:	4 year — 38,500/mo
1435	9080	Computer Language Research, Inc. 4343 Sigma Road Dallas, Tx. 75234 (214) 233-4343	5 year — 37,500/mo
2150	9313		
3621	9824		
3625	9841		
3700	9845		
4650	9903		
7840		Att: Steve Winn	

GET IT TOGETHER

SOFTWARE SUPPORT WITH YOUR COMPUTER LEASE FROM THE WORLD'S LEADING INDEPENDENT SOFTWARE COMPANY.

ALL AVAILABLE IMMEDIATELY WITH I/O SET:

• 360/40H • 360/40G • 2365s • 2361-1

CALL STEVE ELIAS AT (213) 678-0311 OR WRITE TO:

CSC
COMPUTER SCIENCES CORPORATION
650 N. SEPULVEDA BOULEVARD
LOS ANGELES, CALIFORNIA 90245
Major Offices and Facilities Throughout the World

buy•sell•lease•$/360•$/370

WE WANT TO BUY A 50

For Fall Delivery
Check Our Price
Call the Brokerage Division at:

(312) 671-4410

dearborn

dc dearborn computer leasing company • chicago • toronto
st. louis • cincinnati • member computer lessors assoc.

DISK

IBM 2314 A1

Control Unit & Up to 7 Drives
Will Sell or Lease
—— Available Now ——
Call for other Big Savings
Computer Sales, Inc.
901 Office Park Plaza
Oklahoma City, Okla. 73105
Oklahoma City 405/848-8691 Houston 713/444-0246
St. Louis 314/727-7010

360/20

SYSTEM/3

Disk—Tape—Card
Buy—Sell—Trade—Lease

Specialists in Model 20

CMI Corporation
23000 Mack Avenue
St. Clair Shores, MI 48080
(313) 774-9500
TWX 810-226-9708
Member Computer Dealers Assoc.

WANTED

360/30

Industrial Supplier desires to purchase full system with 32K core or larger, including line printer, card reader/punch, discs. Would prefer delivery anytime before 12/31/75. Forward specifications and price to:

McKilligan Industrial Supply Corp.
494 Chenango St.
Binghamton, N.Y. 13901
(607) 724-4311

WANTED
DEC SYSTEM

- 11/04 to 11/40 with 16+K memory, etc.
- RK05 Disk (2)
- DECTAPE, CRT, Printer, etc.

Have $22,000. If you have a similar system or any of the above components write or call John Taft:
MINI TECHNOLOGY, INC.
5712 157th P1 S.W.
Edmonds, Wa. 98020
(206) 743-6768

FOR LEASE

16K Mod 20 (D1)
2203 A1 Printer
2560 A1 MFCM with
Six lines of Print
Best Offer By Owner
Immediate Availability
Northwest Computer Brokers
1400-112th S.E. Suite 100
Bellevue, Wash. 98004
206-455-1418

Buy Sell and Install
Flooring
for your Computer
$$$ Californian's Save$$

We have now opened a large raised flooring warehouse in California to serve the West Coast.

We now have steel flooring available on the West Coast.

Our office and main warehouse are located in N.J. to serve the East and the South.

for NEW AND USED COMPUTER ROOM FLOORING WITH ALL ACCESSORIES

Please call or write:
RAISED FLOOR INSTALLATION INC. 19 Sebago St. Clifton, N.J. 07013 (201) 778-2444 or (212) 594-4039 (415) 546-9466

OPPORTUNITY KNOCKS EVERYDAY
WHEN YOU CONTACT

dpa

LEASING — SELLING — BUYING — TRADING
IBM COMPUTER — 1401-360-370 ALL TYPES
IBM UNIT RECORD — ALL TYPES AVAILABLE

dpa
DPA, INC.
2636 Farrington
Dallas, Texas 75207
Attn: Gene Nicholl-Chrit Brown
AC (214) 637-0950

SALVAGE

Want to get rid of your in-house ribbon re-inker? We will even swap for the ones that don't work!
We have used Tedas (now Burroughs) on hand. Any offers? Telephone: (213) 579-5555.

JUNK DEPT. 2445 Chico Ave. So. El Monte, CA 91733

SYSTEMS 70, INC.

DATA PROCESSING EQUIPMENT SPECIALISTS

2200 E. DEVON AVE., DES PLAINES, ILLINOIS 60018 (312) 827-8135

360/370

buy·sell·lease·trade

TLW

360-370 market place

BUY — SELL — LEASE

TLW COMPUTER INDUSTRIES INC.

ATLANTA: 3570 American Drive, Atlanta, Ga. 30341
404-451-1895 TWX 810-757-3654
CHICAGO: 312-295-2030
WASHINGTON, D.C. 202-466-2470
LOS ANGELES: 213-373-6825

BUY-SELL-LEASE BUY-SELL-LEASE BUY-SELL-LEASE BUY-SELL-LEASE

DATASERV

IBM 360-370
SYSTEM-3
PERIPHERALS

dataserv equipment inc.
6820 SHINGLE CREEK PARKWAY
MINNEAPOLIS MINNESOTA 55430
(612) 560-5450
TWX 910-576-2900
Member Computer Dealers Assoc.

BUY-SELL-LEASE BUY-SELL-LEASE BUY-SELL-LEASE BUY-SELL-LEASE

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

SYSTEM/3
360/20
1130

BUY • SELL • LEASE

For a prompt, competitive quotation on your IBM needs, call or write today.

"The Small Systems Specialists"

ECONOCOM

Economic Computer Sales, Inc.
1255 Lynnfield Road
P.O. Box 17825
Memphis, Tenn. 38117
(901) 767-9130
TWX 810-591-1205
Member Computer Dealers Assoc.

MAGNETIC TAPE

1600 BPI recertified		800 BPI uncertified
2400	$6.00	$3.50
1200	5.00	3.00
seals	thinline	thickline
IBM	Memorex	Scotch

released from GEOPHYSICAL Archives not work tapes
(713) 772-5557 C.A.R.D.
7575 Bellaire Blvd.
Houston, Texas 77036

$MONEY$ TO PURCHASE YOUR COMPUTER LEASES

Our company will purchase for CASH your existing computer leases at a discount. Submit your proposals in writing. All maters confidential.

Reply To:
Box 202
Spring Valley
New York 10977

Looking to buy, lease or sell Honeywell GE Equipment? We have available for sale or lease:
G 615 — Configuration,
G 635 — Configuration,
G 235/245 — Configuration,
G 415 — Tape Configuration,
G 120, G 115, G 105, 130 Discs, 110 Discs, Magnetic Tapes, Paper peripherals. Call or write:
Systems Capital Ltd.
12 Orange Street
LONDON, WC2H 7ED
01-839-2941 Telex: 918655

Lease Buy Sell

DEAL WITH PROFESSIONALS IN PLACEMENT OF PRE-OWNED EQUIPMENT

360/370

"The Nations Largest Wholesale Dealer"

COMPUTER WHOLESALE CORP.
Suite 441-447
National Bank of Commerce
New Orleans, La. 70112
(504) 581-7741

IBM 1401 WITH 1311 DISK

For Sale
Also 729 Tape Drives

D.P. Equipment Marketing Corp.
11 Lucon Drive
Deer Park, L.I. N.Y.
CALL (516) 667-0200

BUY, SELL LEASE, TRADE

IBM COMPUTERS
All Types — 1401, 1440, 1410, 1130, 1620, 360's, 370's, Sys. 3 — All Peripherals.

UNIT RECORD EQUIPMENT
All Models — Completely Refurbished and under IBM M/A.

DISK PACKS
Completely Recertified. Guaranteed-Immeidate Delivery, Lowest Prices.

Data Automation Co. Inc.
4858 Cash Road, Dallas, Texas 75247
(214) 637-6570 Call Collect
"Member Computer Dealers Assoc."

TELETYPE® SYSTEMS

NEW/REMANUFACTURED
- ALL MODELS
- PARTS & ACCESSORIES
- TWX & TELEX TERMINALS

IMMEDIATE DELIVERY
Wanted: Used TTY SYSTEMS

vardon & associates, inc.
930 N. Beltline Road • Irving, Texas 75061
214/252-7502 • TWX-910-860-5761

PROFESSIONAL COMPUTER DEALERS IN THE WEST

SMI

FOR SALE
370/135, 370/145

SYSTEMS MARKETING, INC.
100 West Clarendon
Suite 1562
Phoenix, Ariz. 85013
Bob Russell
(602) 248-0457
Telex 667-334

SUPER SALE!! IMMEDIATE DELIVERY!!

EXTENSION MEMORIES FOR SALE/LEASE

System 3
Model 10

System 360
Model 22, 25, 30, 40, 44, 50, 65, 67, LCM

System 370
Model 155, 165

Univac
Model 1108, 1106, 494

Available through the following Sales Offices:
Boston 617/969-5077
Chicago 312/437-4116
Dallas 214/661-3155
Denver 303/753-0631
Detroit 313/348-2161
Long Beach 213/420-2493
Minneapolis 612/935-8811
Orlando 305/857-1050
Philadelphia 215/643-7512
San Jose 408/246-8391

FABRI-TEK INC.
5901 So. County Rd. 18
Minneapolis, Minn. 55436

SAVE $100,000

A complete 1500 sq ft computer room (formerly occupied by IBM) capable of accommodating any computer installation is INCLUDED at NO EXTRA RENTAL when you lease office space in the prestigious, new

INVESTMENT BUILDING
One Investment Place
York & Dulaney Valley Rd.
Towson, Maryland

9,000 or 20,000 Sq Ft At Very Competitive Rents

- Electricity Included
- Year-round Climate Control
- Garage in Building
- Banks in Building
- Restaurant & Cocktail Lounge in Building
- Music Throughout

Occupancy June 1st
BROKERS PROTECTED

Leasing Agent on Premises
EDWARD A. GRIFFITH
(301) 823-1320

SALE OR LEASE

IBM Unit Record

024-$350;	026-$1000;
046-$1800;	056-$250;
077-$500;	082-$900;
083-$2200;	084-$2500;
085-$1300;	088-$2900;
188-$12,000;	403-$1000;
407-$1500;	514-$900;
519-$1200;	548-$2000;
552-$1200;	557-$3700;
	402-$900;

THOMAS COMPUTER CORPORATION
Suite 3807A
600 N. McClurg Court
Chicago, Ill. 60611
(312) 944-1401

1130
1401

Systems & Components
New Low Prices
Purchase - Lease

CMI Corporation
23000 Mack Avenue
St. Clair Shores, Mich. 48080
(313) 774-9500
TWX 810-226-9708
Member Computer Dealers Association

Honeywell 200

Central Processor 24K 201-2-6; Tape Control unit 203B-1; Magnetic Tape unit 20KC 204B-1; (3) Magnetic Tape units 20KC 204B-2; Card Punch Control 208-1; Card Reader 600 CPM 223; Advanced Programming 010; Edit Instruction 013; IBM Format Feature 050; IBM Capability Code 051; Printer 650 LPM 222-3; Punch 200 CPM 214-1; Extended Print 032.

Price $42,500 firm f.o.b. Denver. Contact David Lawrence, 828 17th Street, Denver, Colorado 80202 (303) 292-1010

WE WANT TO BUY Teletype® Model's

28·33·35

Modems — Couplers — Other Data Communication Equipment
WE ALSO SELL THE ABOVE
Call or Write:
DATA COMMUNICATION EQUIPMENT BROKERS, INC.
1878 Thunderbird Street
Troy, Michigan 48084
(313) 362-0470

TIME FOR SALE

IBM UNIT RECORD EQUIPMENT

024	083	402	523
026	084	403	548
029	085	407	552
056	087	408	557
077	088	514	602
082	089	519	604

We Buy, Sell or Lease 360 - 20 System 3 1130

IBM COMPUTERS

Special Sale 029's All Models

Big Savings — up to 50% on Short Term Rentals
Call us for all your needs, we buy, rent and sell all types of IBM unit record equipment. Over 12 years of serving commercial and government requirements. All equipment rebuilt at our own factory and guaranteed for IBM MAINTENANCE. Contact: John Fennell V.P. for proposal. 212-689-4747 Cable: Leasatron, New York Telex: 423857 LMC U1 116 East 27th Street New York, New York 10016

LMC Data, Inc.

new jersey

I.B.M.-360'S

All shifts available on 4 - 360 computers with all features, 2314's, 2311's, 2402's - 800 BPI 9TRK, 2402's - 7TRK, 2401's - 1600 BPI 9TRK, 1403's - N1, 2540's, 2703 with ASYN & BISYNC Port.
Prices start at $35.00 per hour. We also offer complete Batch and Tele-processing services. Configuration can be modified to accomodate any 360 computer user. We have on site CE's.

UCS Computer Centers
Route 80
Dover, N.J. 07885

Contact Bill Kersey at (201) 361-8600 or Joe Kelly at (201) 361-8601

370	360	I.O	MISC.
3145	2020	1403	2401
3155	2030	2540	2804
3158	2040	2821	2803
3360	2050	2314	2319
3345	2065	3803	CORE

BUY — SELL — LEASE
ALL THE ABOVE & MORE
Pioneer Computer Marketing
2636 Farrington
Dallas, Texas 75207
(214) 637-0950
Member Computer Dealers Association

new york

SELLING:

370/155 S/N 10756 Sept.
370/145 S/N 10682 July
370/155 S/N 10392 Oct.
370/145 S/N 10551 Aug.

LEASING:

370/155 (1.5 MB 1-yr. lease Immed) 370/165

BUYING:

360/65 360/50

IPS

IPS COMPUTER MARKETING CORP.
467 Sylvan Avenue,
Englewood Cliffs,
New Jersey 07632
(201) 871-4200,
TWX (710) 991-9677
"MEMBER COMPUTER DEALERS ASSOCIATION"

FOR SALE/LEASE

370/156-K with DAT
1130 systems, all configurations (John Wanta)
I/O Sets & 3360's MOD 3's

370/158
370/168

NEW LEASE PROGRAM

Let Decimus take over your present 370/158 Lease and provide you with a NEW 370/168 LEASE

DECIMUS CORP

261 Madison Ave., N.Y.C. 10016

Dick Lanigan
212-953-0050

John Wanta
713-444-4970

THE EDP CENTER FOR EDP PROFESSIONALS

- Computer Time Sales
- Data Entry Services
- Systems Design
- Equipment Leasing
- RJE Services
- Programming and other services

OS DOS

Write or phone Marketing Manager at (212) 349-5340

MARKETIME CORPORATION
A subsidiary of National Computer Corporation
15 Maiden Lane
New York, N.Y. 10038

time for sale

new york

Thomas National, Inc.

1775 Broadway, N.Y.C.

370/158 DATACENTER

OS-VS – RJE
And Other Communications

Automated Photo Composition

DOS Emulation
3330's and 2314's

Systems and Programming Support

Data Entry Services

Convenient 57th St. Location
Open 24 Hours Per Day
Call (212) 765-8500

370/158

VS2-HASP/RJE, TSO
DOS Emulation
Disks-(18) 3330, (3) 2319
Tapes-(16) 3420 mod. 7
Printers-(5) 1403, (1) 3211

Excellent Technical Support
Very attractive rates on all shifts

Contact: Stu Kerievsky
(212) 564-3030
Datamor
132 West 31 St.
New York, N.Y. 10001

WE ARE
BROKERS OF COMPUTER TIME
Computer Reserves, Inc.
(212) 687-1840

KEYPUNCHING

New York City Area

special rates for 3 day turnover all work guaranteed 99.5% accurate.

W.R.S. Keypunch Service
67 Broad Street
New York, N.Y. 10004
(212) 425-6780

illinois

IBM 360/370 USERS
COMPUTER TIME AVAILABLE

370/158
3 meg, 3330 (32m), 2314 (16m), 12 3420-5 d.d. tape
OS/VS2, RJE, TSO, ATS, DOS emul.

24 Hours – 7 Days

370/155
2 meg, 3330 (16m), 2314 (8m), 10 3420-5 d.d tape

370/135
240K, 3330 (4m), 2314 (8m), 6 3420-5 d.d. tape

360/50
512K, 2314 (8m), 8 2402-6 d.d. tapes

FOR FURTHER INFORMATION
JIM WHITELEY
(312)346-1331

computer research company
200 N. Michigan Avenue
Chicago, Ill. 60601

Largest Computer Time Sales Co.

SOFTWARE FOR SALE

SEMINARS

General Ledger
Financial Reporting
Accounts Payable
Accounts Receivable

Learn about our family of Financial Application Systems by attending information-packed seminars, offered year-round in major cities in the U.S. and Canada. Call or write for complete information and registration form.

informatics inc

65 Route 4
River Edge, N.J. 07661
New York (212) 564-1258
New Jersey (201) 488-2100
Chicago (312) 325-5960
Los Angeles (213) 881-3722

Worlds Largest in Software Products

Looking for accounting systems? Talk to the leaders.

Over 1000 of them use ours.

Infonational offers a complete system of accounting software or computer services. **General Ledger, Accounts Receivable, Accounts Payable, Fixed Assets, etc.** Programs that can be used separately or as a totally integrated system.

Check the features of our proven systems – professional documentation, on-site training programs, our 99 year unconditional warranty. See why our systems have been chosen by over 1000 of the world's leading firms. Including many banks and processing centers.

Call or write for our literature and the office nearest you. Ask to see our client list so you can find out about us for yourself.

Infonational World Headquarters, Dept. 102, P. O. Box 82477, San Diego, CA 92138 or call (714) 560-7070.

INFONATIONAL
talk to the leaders

software for sale

AUTOMATED TAPE LIBRARY

If maintaining your tape library is getting to be a hassle, this system provides an effective, low cost approach to automating this function.

Reports provided include; tapes scratched, tapes saved and tapes expired by serial number, file I.D. and keyword.

A one time fee of $695.00 provides you with the source module in IBM ANS Cobol for DOS and all required documentation.

30 DAY FREE TRIAL!
WRITE TO:
Occidental Computer Systems
10202 Riverside Drive
No. Hollywood, Calif. 91602
(213) 763-5144

TAXBREAK

***
Payroll tax calculation module
***

Calculates payroll withholding taxes for 50 states, federal, FICA and cities. COBOL. $875 complete.

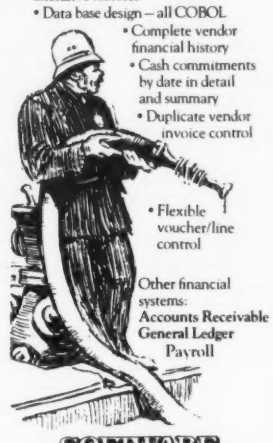
Maintenance service on tax changes available for $225 per year.

ARGONAUT INFORMATION SYSTEMS, INC.
2140 Shattuck Ave.
 # 203
Berkeley, CA. 94704
(415) 845-7991

MMS
Accounts Payable-II Keeps The Well From Going Dry!

Exclusive features:
- Data base design – all COBOL
- Complete vendor financial history
- Cash commitments by date in detail and summary
- Duplicate vendor invoice control
- Flexible voucher/line control

Other financial systems:
Accounts Receivable
General Ledger
Payroll



SOFTWARE INTERNATIONAL
Elm Square, Andover, Ma. 01810
(617) 475-5040

SYSX

LOOKING FOR SOFTWARE?

From an active file of over 1200 Software Suppliers we can help you locate quality software packages. Write or Call: Tom Weaver.

Systems Exchange Co.
1034 Colorado Ave.
Palo Alto, Calif. 94303
(415) 328-5490

Software Suppliers

We are currently looking for:
- RPG/RPG II conversion to Cobol
- Dynamic tape library Univac 1110 EXEC VIII
- Bowling league package 370/145 OS
- Accounting in Fortran for 32K Mini

Software Breakthrough For Mini's

Multi Users on line ANS COBOL Compiler now available. Top quality 16K or 32K versions

SYSX

software for sale

SYSTEM 32

SOFTWARE PACKAGES

Association Membership and Publications package now available. Manufacturing with order entry, billing, etc. and Travel Agency programs available 8/15/75. **For information contact Saul Hanges, Computer Dynamics Corporation, 401 Cooper Landing Road, Cherry Hill, N.J. 08034. (609) 667-8888.**

McCORMACK & DODGE CORPORATION

HAS
DEVELOPED
MARKETED
MAINTAINED

Accounting-oriented software products over the past five years.
Over 400 companies in the U.S. are using one or more of the following:

Fixed Asset Analysis & Accounting System
Accounts Receivable System
Investment Analysis System
Accounts Payable System

McCORMACK & DODGE CORPORATION

381 Eliot St.
Newton Upper Falls, Mass. 02160
(617) 965-3750

software for sale

ACCOUNTING SYSTEMS

PAYROLL
GENERAL LEDGER
ACCOUNTS PAYABLE
INVENTORY
ACCOUNTS RECEIVABLE

IBM SYSTEM/3 USERS
IBM 360-70 USERS
RPG II BAL COBOL

Certified Software Products, Inc.
3140 Harbor Lane North
Minneapolis, Minn. 55441
612-546-6919

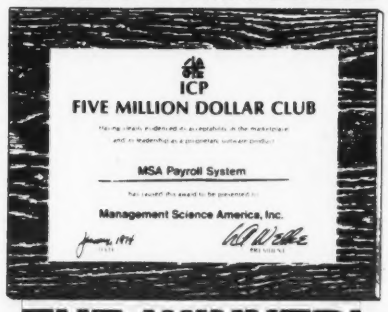
Weather the Stormy Seventies with MMS GENERAL LEDGER

- Maximizes Internal Control
- Strengthens Cash Management
- Provides Most Reliable Forecasting

Other Financial Systems:
Accounts Receivable
Accounts Payable
Payroll/Personnel

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01801
(617) 475-5040

MSA PAYROLL



THE WINNER!

Over **350** businessmen like you have purchased our system, making it the most widely used system in the country. They didn't buy it because of any sales gimmick or fancy ad. but simply because it is the **best system available.** Its key features are:

- **100 DEDUCTIONS**
- **6 LEVELS OF CONTROL**
- **SALARIED AND HOURLY PAY**
- **COMMISSIONS AND SPECIAL PAY**
- **SPECIAL REPORT GENERATOR**
- **BANK SERVICES FEATURES**
- **LABOR DISTRIBUTION**
- **COMPREHENSIVE CANADIAN REPORTING**
- **AUTOMATIC CHECK REVERSAL**
- **COMPLETE TAX REPORTING**
- **SALARY HISTORY**
- **SKILLS INVENTORY**
- **PERFORMANCE RATING**
- **USES "ALLTAX" TAX SERVICE**
- **IBM 360/370; BURROUGHS; RCA**
- **ANS COBOL; OS; DOS**

WRITE OR CALL WILLIAM M. GRAVES – 404/262-2376
MANAGEMENT SCIENCE AMERICA, INC.
3445 PEACHTREE RD., N.E., SUITE 1300, ATLANTA, GA. 30326

NEW YORK	CHICAGO	LOS ANGELES	HOUSTON
201/871-4700	312/323-5940	213/475-9726	713/521-0087

GA Head Calls Quarter 'Turnaround Point'

ANAHEIM, Calif. – With nine-month results reflecting a $2.5 million write-off stemming from the firm's decision to abandon its silicon-on-sapphire products, General Automation, Inc. (GA) Chairman Lawrence Goshorn declared the third quarter a turnaround point for the company.

Backlog has increased to $27.5 million, the highest level in company history, from $23.6 million at this time last year, and the firm has begun shifting its marketing direction to areas other than electronic test and assembly and factory automation, he said.

Noting the above areas have been adversely impacted by the recession, he said GA is now shifting to other areas including banking and process control.

"This shift in resources produced a distinct improvement in the overall order rate during the third quarter as shown by our backlog increases," Goshorn said.

GA's initial efforts in these new market areas involve specialized systems which have lower than normal margins, he noted.

"As a result of these developments and reduced shipping levels, we experienced some pressure on operating margins in the third quarter and expect such pressure to continue into the fourth quarter," he added.

For the third quarter, GA lost $660,000 or 27 cents a share compared with earnings of $1.1 million or 43 cents a share in the same period last year.

Revenues declined to $13.2 million compared with $15.2 million in the year-ago quarter.

During the nine months ended May 3, the loss, including the write-off, stood at $2.5 million or $1.02 a share compared with earnings of $2.9 million or $1.15 a share in the year-ago period.

Revenue, however, rose slightly to $41.39 million compared with $41.37 million in the same 1974 period.

Selling, general and administrative expenses have been reduced from second-quarter levels, but not to last year's level, Goshorn said, because the firm feels it is important to maintain the current level to prepare for the business turnaround.

"We have not reduced our efforts in important corporate projects," he said.

...Toward the Bottom Line

IBM is increasing its quarterly dividend by 25 cents to $1.75 a share payable Sept. 10 to holders of record Aug. 13.

$$$

Burroughs has declared a quarterly dividend of 15 cents a share payable Aug. 7 to shareholders of record July 9.

$$$

Data General's recent offering of 1 million-shares of common was sold out, netting the firm $29.25 million which it will use for long-term future growth.

$$$

Storage Technology is listed on the New York Stock Exchange under the symbol STK.

Ampex Earnings for Year Double Despite Loss in Fourth Quarter

REDWOOD CITY, Calif. – Despite a $5.9 million loss during the fourth quarter, Ampex Corp. managed to nearly double its earnings to $10.3 million for the year ended May 3.

President Arthur H. Hausman termed the year "significantly successful," noting that, in addition to increased profit, sales were essentially equal to those in 1974 despite the economic conditions and a lower personnel base.

During the fourth quarter, the firm lost $5.9 million or 54 cents a share including $2.5 million extraordinary loss from the total year's utilization of net operating loss carryforward and $3.5 million from discontinued operations, including its tape music business.

During the 1974 fourth quarter, Ampex earned $1.3 million or 12 cents a share after a $500,000 loss from discontinued operations.

Revenues dipped to $64.1 million from $72.4 million in the year-ago period.

Year Results

For the year ended May 3, Ampex earned $10.3 million or 95 cents a share, including a $4.3 million operating loss carryforward credit compared with $5.4 million or 50 cents a share last year, when there was a $1.3 million credit.

Revenues for the year totaled $244.9 million compared with $248.3 million last year.

Find minicomputer software services FAST
in the new 1975 Minicomputer Software Directory

Designed for professionals by professionals, the 1975 Minicomputer Software Directory is a primary source for locating services and application packages currently available for the minicomputer user. Directory sections provide supplier company profiles, an alphabetic services/application index, supplier geographic locator and CPU's supported by listed suppliers. An invaluable source book for those in the minicomputer industry who want to know or be known, the Minicomputer Software Directory is available now at an annual subscription price of $45, including two 1975 updates.

Send your check or purchase order to: **Minicomputer Data Services, 20 Coventry Lane, Riverside, CT 06878**
Suppliers, send for listing information kit.

FOR CREDIT BUREAUS ONLY

Now you can computerize your own credit bureau and operate independently

1. Eliminate the on-line dedication to larger companies.
2. Eliminate the troublesome gamble and routine of investigating computer companies and programmers.
3. Our software and hardware will provide you with a guaranteed system of file management immediately, on a licensing agreement, far below national average costs.

Our technical staff and knowledge is at your disposal.
Write or contact without obligation

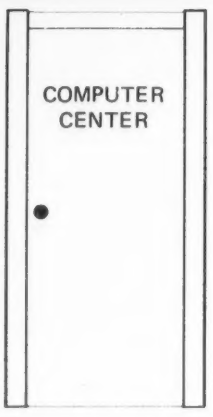
THE UNITED CREDIT BUREAU OF AMERICA
I.N.A. Bldg. — Baltimore, Maryland 21202
Phone: (301) 685-7620 • Telex: USB (087522)

1333 LPM PRINTER
OFF-LINE DATAPRODUCTS 4000
SATELLITE PRINT STATIONS
START AT $11,000
AMERICAN USED COMPUTER CORP
Box 68 Kenmore Sta. Boston, Ma. 02215 617-261-1100
Member Computer Dealers Association

DESTROYED DATA Can't be computed

The **Model 918 Magnetic Field Detector** is a true magnet detector, not a metal detector. Metal objects—keys, tools, etc., will not activate the unit unless they are magnetized. A magnetized screwdriver, for example, could irretrievably erase information from a tape or disc pack.

The ever increasing danger of data loss can be reduced. The **Model 918 Magnetic Field Detector** will instantly detect any movement of a magnetic field through the sensor area alerting security to any attempt—malicious or accidental—to carry a magnet or a magnetic device into the protected area.



MAGNETIC FIELD DETECTOR Model 918

Columns are 4" x 84". Protective cover factory finish is beige. Units may be painted to match door trim or walls. Sensitivity: 50 gauss. Alarm and control signal light panel in an EIA Standard 5¼", 19" rack mount enclosed in brushed aluminum cabinet.

JB INDUSTRIES
7895 Convoy Ct.
Suite XIII
San Diego, CA92111
(714) 277-5745

JB INDUSTRIES
79 Chamberlain
Rochester, NH03867
(603)322-6674

SAVE

370/165 W/DAT

370/155 W/DAT

Lease directly with one of the country's foremost IBM 370 lessors.

Contact: J. Frolick

Computer Systems Of America, Inc.
141 Milk Street
Boston, MA. 02109
(617) 482-4671

YOU

DP Managers. Programmers. Auditors. Marketing Managers. Controllers. Managers of Information Systems. To do your job well, you need the best tools available. Four of the best utility software tools in the world are available from Pansophic Systems Incorporated. Over 300,000 data processing professionals around the world use one or more of them every day. Shouldn't you find out why?

PANVALET
The Program Management and Security System

PAN*DA
The Disk Analysis and Data Set Management System

EASYTRIEVE
The Information Retrieval and File Management System

PAN*SORT
The Advanced Sort/Merge System

PANSOPHIC SYSTEMS, INC.
1301 W. 22nd St., Oak Brook, IL 60521
EAST 201/622-0190; CENTRAL 312/325-8212; WEST 213/430-7551

PANSOPHIC SYSTEMS OF CANADA LTD, 6600 Transcanada Highway, Pointe Claire, Quebec
PANSOPHIC SYSTEMS-EUROPE INC., Princess House, Eastcastle Street, London, England
PANSOPHIC SYSTEMS AUSTRALASIA PTY LTD, 133 Alexander St., Crows Nest N.S.W. 2065, Australia

Earnings Reports

METRIDATA COMPUTING
Three Months Ended March 31

	1975	1974
Shr Ernd	$.20	$.15
Revenue	1,426,000	1,160,000
Tax Cred	16,000	26,000
Earnings	72,000	55,000

TEC
Nine Months Ended March 31

	1975	1974
Shr Ernd	$.38	$.74
Revenue	5,752,057	5,555,878
Earnings	262,211	502,388

TIME SHARING RESOURCES
Nine Months Ended Feb. 28

	1975	1974
Shr Ernd	$.14	$.06
Revenue	1,095,506	664,248
Tax Cred	51,000	19,200
Earnings	114,884	50,777

INTER-CONTINENTAL COMPUTING
Three Months Ended March 31

	1975	1974
Shr Ernd	$.06	$.01
Revenue	823,067	648,132
Earnings	76,058	9,847

COMPUDYNE
Three Months Ended March 31

	1975	a1974
Shr Ernd	$.02	.....
Revenue	10,031,989	$7,396,533
Earnings	138,829	60,780
6 Mo Shr	.05	.01
Revenue	20,166,951	14,473,695
Earnings	271,611	128,995

a-Restated to reflect change to Lifo method for certain inventory.

COMPUTER USAGE
Three Months Ended March 31

	1975	1974
Shr Ernd	$.19	$.24
Revenue	1,166,392	1,150,710
Tax Cred	55,500	97,500
Earnings	153,235	206,094
6 Mo Shr	.42	.41
Revenue	2,232,914	2,247,784
Spec Cred	137,500	166,000
Earnings	327,088	352,183

ECRM
Three Months Ended March 29

	1975	1974
Shr Ernd	.....	$.02
Revenue	$1,246,000	1,746,000
Earnings	(150,000)	24,000

ELECTRONIC TABULATING
Three Months Ended March 31

	1975	1974
Shr Ernd	$.16	$.15
Revenue	751,287	686,433
Earnings	65,923	62,616

DATAPRODUCTS
Year Ended March 29

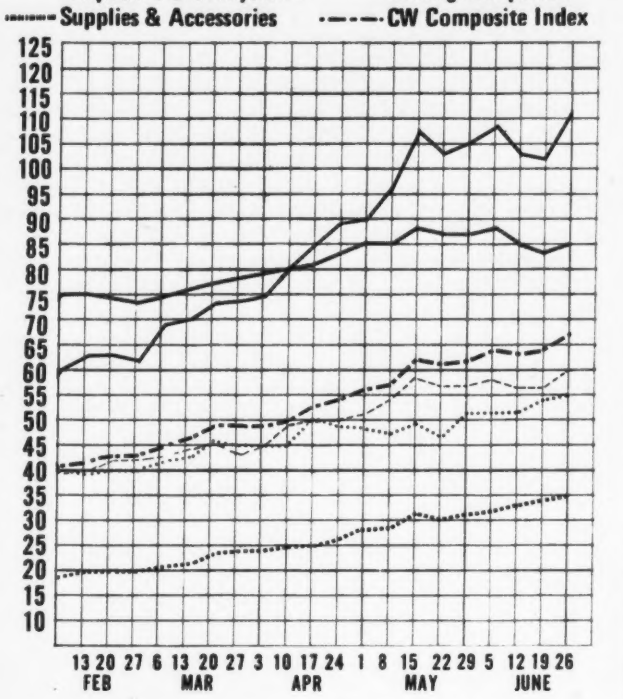
	1975	a1974
Shr Ernd	$.86	$1.16
Revenue	94,686,000	75,795,000
Tax Cred	.....	2,894,000
Earnings	5,818,000	7,861,000
3 Mo Shr	.19	.32
Revenue	23,225,000	21,850,000
Tax Cred	.....	762,000
Earnings	1,300,000	2,177,000

a-Restated.

REMOTE COMPUTING
Three Months Ended Jan. 31

	1975	1974
Shr Ernd	$.16	$.08
Revenue	1,929,670	974,897
Tax Cred	57,090	24,472
Earnings	117,575	50,985
9 Mo Shr	.27	.26
Revenue	4,880,712	2,838,066
Tax Cred	94,733	77,284
Earnings	195,081	174,551

COMPUTERWORLD Computer Stocks Trading Indexes



Computerworld Sales Offices

Vice President — Marketing
Neal Wilder
Sales Administrator:
Dottie Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
Phone: (617) 965-5800
Telex: USA-92-2529

Northern Regional Manager
Robert Ziegel
Account Manager
Mike Burman
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
Phone: (617) 965-5800
Telex: USA-92-2529

Eastern Regional Manager
Donald E. Fagan
Account Manager
Frank Gallo
COMPUTERWORLD
2125 Center Avenue
Fort Lee, N.J. 07024
Phone: (201) 461-2575

Western Regional Manager:
Bill Healey
1212 Hearst Bldg.
San Francisco, Calif. 94103
Phone: (415) 495-0990

Japan:
Ken Suzuki
General Manager
Dempa/Computerworld
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
Phone: (03) 445-6101
Telex: Japan-26792

United Kingdom:
Michael Young
Computerworld Publishing Ltd.
140-146 Camden Street
London NW1 9PF, England
Phone: (01) 485-2248
Telex: UK-26-47-37

West Germany:
Otmar Weber
Computerworld GmbH
8000 Munich 40
Tristanstrasse 11
West Germany
Phone: (089) 36-40-36
Telex: W.Ger-5-215350-HKFD

TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 25, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE JUN 25 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-108	106 1/2	+7 1/4	+7.3
O	COMPUTER AUTOMATION	2- 8	6 7/8	- 1/8	-1.7
N	CONTROL DATA CORP	11- 23	22 3/8	+1 1/8	+5.2
N	DATA GENERAL CORP	10- 33	30 1/8	+2 7/8	+10.5
O	DATAPOINT CORP	6- 25	22 3/4	+4 1/2	+24.6
O	DIGITAL COMP CONTROL	1- 4	3 1/4	+ 1/4	+8.3
N	DIGITAL EQUIPMENT	46-112	111 5/8	+11 1/4	+11.2
N	ELECTRONIC ASSOC.	2- 3	2 3/4	- 1/4	-8.3
A	ELECTRONIC ENGINEER.	5- 10	9 1/2	- 1/8	-1.2
N	FOXBORO	23- 40	39 1/2	+3 3/4	+10.4
O	GENERAL AUTOMATION	6- 11	8 1/4	- 1/4	-2.9
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	58-118	117 1/2	+7 1/2	+6.8
N	HONEYWELL INC	22- 40	40	+2 1/4	+5.9
N	IBM	158-224	210 1/2	+6 1/4	+3.0
O	MEMOREX	1- 10	8 3/4	+ 7/8	+11.1
O	MICRODATA CORP	2- 4	4 1/8	+ 3/4	+22.2
O	MODULAR COMPUTER SYS	5- 18	15 3/4	+ 1/2	+3.2
N	NCR	15- 39	38 7/8	+1 3/8	+3.6
N	PERKIN-ELMER	16- 29	29 1/4	+4 1/4	+17.0
N	RAYTHEON CO	26- 59	57 1/4	+2 3/4	+5.0
N	SINGER COMPANY	10- 17	14 3/4	- 1/2	-3.2
N	SPERRY RAND	26- 47	47	+4 3/4	+11.2
A	SYSTEMS ENG. LABS	1- 4	3 3/4	0	0.0
O	ULTIMACC SYSTEMS INC	1- 6	5 5/8	+ 1/8	+2.2
N	VARIAN ASSOCIATES	7- 18	17 5/8	+7 1/8	+67.8
N	WANG LABS.	7- 17	16 1/2	+2 7/8	+21.1
N	XEROX CORP	51- 86	68 1/4	+1 7/8	+2.8
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	4 5/8	+ 3/8	+8.8
A	COMMERCE GROUP CORP	2- 4	2 7/8	- 1/8	-4.1
A	COMPUTER INVSTRS GRP	1- 2	1 1/8	- 1/8	-10.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 5	4 7/8	0	0.0
O	EDP RESOURCES	2- 2	2	0	0.0
A	GRANITE MGT	1- 5	4 3/4	+ 3/8	+8.5
A	GREYHOUND COMPUTER	2- 3	3 1/8	- 1/4	-7.4
A	ITEL	3- 8	7 3/8	+ 1/4	+3.5
N	LEASCO CORP	4- 8	5 3/4	- 1/4	-4.1
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 4	3 3/8	0	0.0
A	PIONEER TEX CORP	2- 5	5	+ 3/4	+17.6
A	ROCKWOOD COMPUTER	1- 1	5/8	0	0.0
N	U.S. LEASING	9- 14	11 7/8	+2	+20.2
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	7/8	0	0.0
A	APPLIED DATA RES.	1- 10	2 1/2	- 1/8	-4.7
N	AUTOMATIC DATA PROC	29- 62	58 1/4	+2 7/8	+5.1
O	BRANDON APPLIED SYST	1- 1	1/4	+ 1/8	+100.0
O	CENTRAL DATA SYSTEMS	3- 3	5 1/2	+2 1/2	+83.3
O	COMPUTER DIMENSIONS	2- 6	5 1/2	0	0.0
O	COMP ELECTION SYSTMS	3- 6	4 7/8	- 1/4	-4.8
O	COMPUTER HORIZONS	1- 1	3/4	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/2	+ 5/8	+33.3
N	COMPUTER SCIENCES	2- 6	5 1/2	- 3/8	-6.3
O	COMPUTER TASK GROUP	1- 1	5/8	- 1/8	-16.6
O	COMPUTER USAGE	2- 4	2 5/8	0	0.0
O	COMSHARE	3- 4	3 3/4	+ 1/8	+3.4
O	DATATAB	1- 1	1 1/4	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	22 7/8	+1 7/8	+8.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1/2	0	0.0
O	KEANE ASSOCIATES	2- 3	2	0	0.0
O	KEYDATA CORP	2- 3	2 3/4	- 1/8	-4.3
O	LOGICON	3- 5	4 1/4	+ 1/4	+6.2
A	MANAGEMENT DATA	1- 3	2	- 1/8	-5.8
O	NATIONAL CSS INC	6- 14	13	+1 1/2	+13.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 14	13 3/8	+ 1/2	+3.8
N	PLANNING RESEARCH	2- 6	5 1/4	+ 5/8	+13.5
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 5	4 7/8	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1/4	0	0.0
O	TYMSHARE INC	7- 20	18 3/4	+ 1/4	+1.3
A	URS SYSTEMS	2- 3	2 5/8	+ 1/8	+5.0
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 3/4	- 1/8	-1.5
O	ADVANCED MEMORY SYS	1- 7	6 1/2	+1 1/8	+20.9
N	AMPEX CORP	3- 7	6 1/8	+ 1/4	+4.2
O	ANDERSON JACOBSON	1- 3	2 1/2	- 1/4	-9.0
O	BEEHIVE MEDICAL ELEC	1- 5	4 5/8	+ 1/8	+2.7
A	BOLT,BERANEK & NEW	5- 10	9 5/8	+1 1/8	+13.2
N	BUNKER-RAMO	4- 7	7 1/4	+ 1/4	+3.5
A	CALCOMP	4- 7	6 5/8	+ 7/8	+15.2
O	CAMBRIDGE MEMORIES	3- 5	4	- 1/2	-11.1
N	CENTRONICS DATA COMP	7- 22	20	+1 3/4	+9.5
O	CODEX CORP	15- 38	34	+1	+3.0
O	COGNITRONICS	1- 1	1 1/2	0	0.0
O	COMPUTER COMMUN.	1- 2	1 1/2	+ 1/4	+20.0
O	COMPUTER CONSOLES	3- 7	5	- 1/4	-4.7
A	COMPUTER EQUIPMENT	1- 2	1 3/4	0	0.0
O	COMPUTER MACHINERY	1- 2	1 3/4	+ 1/2	+40.0
O	COMPUTER TRANSCEIVER	1- 2	1 3/8	- 1/8	-8.3
O	COMTEN	2- 5	4 7/8	0	0.0
N	CONRAC CORP	12- 20	17 7/8	+ 3/4	+4.3
O	DATA ACCESS SYSTEMS	1- 3	2 1/8	+ 1/8	+6.2
O	DATA 100	5- 16	13	+ 1/4	+1.9
A	DATA PRODUCTS CORP	2- 6	5 5/8	+ 3/8	+7.1
O	DATA TECHNOLOGY	1- 3	1 5/8	- 1/8	-7.1
O	DATUM INC	1- 2	1	0	0.0
O	DECISION DATA COMPUT	4- 7	6 3/8	- 1/2	-7.2
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIMAN CONTROLS	1- 1	1 3/8	+ 1/8	+10.0
N	ELECTRONIC M & N	1- 2	2	+ 1/8	+6.6
O	FABRI-TEK	1- 1	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	2	0	0.0
N	HAZELTINE CORP	3- 4	4	+ 1/8	+3.2
N	HARRIS CORP	18- 26	26 3/8	+3 7/8	+17.2
A	INCOTERM CORP	3- 10	10	+1 1/2	+17.6
O	INFOREX INC	2- 5	4 1/8	+ 1/2	+13.7
O	INFORMATION INTL INC	8- 14	13 1/4	+ 3/4	+6.0
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	8- 20	19 1/8	+1 1/8	+6.2
N	MOHAWK DATA SCI	1- 5	3 1/2	+ 3/8	+12.0
O	OPTICAL SCANNING	1- 3	3	0	0.0
O	PENRIL CORP	2- 2	1 7/8	0	0.0
O	PERTEC CORP	2- 8	6 3/8	+ 3/8	+6.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/4	0	0.0
O	QUANTOR CORP	2- 6	6	+1 1/4	+26.3
O	RECOGNITION EQUIP	2- 9	9	+2 1/2	+38.4
N	SANDERS ASSOCIATES	3- 11	9 7/8	+1 1/8	+12.8
O	SCAN DATA	1- 3	1 3/4	+ 1/8	+7.6
O	STORAGE TECHNOLOGY	6- 15	13 1/8	+ 5/8	+5.0
O	SYCOR INC	5- 14	13 1/2	+ 1/4	+1.8
O	TALLY CORP.	1- 5	3 5/8	+ 1/8	+3.5
O	TEC INC	1- 3	2 3/4	0	0.0
N	TEKTRONIX INC	18- 39	38 1/2	+3	+8.4
N	TELEX	1- 3	2 3/4	+ 1/8	+4.7
O	WANGCO INC	4- 7	6	+ 1/4	+4.3
O	WILTEK INC	1- 4	3	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	5	0	0.0
A	BARRY WRIGHT	5- 7	6 1/4	+ 1/4	+4.1
O	CYBERNATICS INC	1- 1	3/4	0	0.0
A	DATA DOCUMENTS	29- 42	33 3/4	+ 1/2	+1.5
O	DUPLEX PRODUCTS INC	12- 25	21 7/8	+2 1/4	+11.4
N	ENNIS BUS. FORMS	5- 7	6 1/4	+ 3/8	+6.3
O	GRAHAM MAGNETICS	5- 9	6 3/4	- 1/2	-6.8
O	GRAPHIC CONTROLS	8- 21	16 1/2	+ 3/8	+2.3
N	3M COMPANY	43- 68	66	+3 1/8	+4.9
O	MOORE CORP LTD	39- 50	49 1/2	+1 1/4	+2.5
N	NASHUA CORP	15- 22	17 7/8	+ 7/8	+5.1
O	REYNOLDS & REYNOLD	11- 24	14 1/2	0	0.0
O	STANDARD REGISTER	11- 18	17 1/4	0	0.0
O	TAB PRODUCTS CO	4- 8	6 1/2	0	0.0
N	UARCO	17- 24	22 5/8	+ 1/8	+0.5
O	VANIER GRAPHICS CORP	4- 7	5 1/2	+ 1/4	+4.7
A	WABASH MAGNETICS	3- 5	4 3/4	+ 5/8	+15.1
N	WALLACE BUS FORMS	15- 25	22 3/4	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Itel's DAP Box virtually turns your 360 into a 370.

Introducing the ultimate add-on performance package for your presently owned or leased IBM 360 Model 40, 50, or 65.

Itel's DAP (DOS/VS And Peripherals) Box. A comprehensive combination of Itel's own Monolithic Main Memory, 3420 Compatible Tape Drives, 3330 Compatible Disk Drives.

And DOS/VS. The same used on a virtual 370, enhanced with eight partition support and resident transients. So your DAP-equipped 360 can run DOS/VS program products, including all 370 instructions.

Think about it:

With Itel's DAP Box, a Model 40 can be as powerful as a 125; a Model 50 more powerful than a 135; a Model 65 more powerful than a 145.

And if you don't have a 360 right now, Itel can supply you with a DAP-equipped one immediately.

At Itel, we couldn't have acquired over a billion dollars in IBM computer leasing experience without getting a jump on the competition.

ITEL CORPORATION
DATA PRODUCTS GROUP
One Embarcadero Center
San Francisco, CA 94111
Phone: (415) 983-0272
Attention:
DATA PRODUCTS GROUP

Your financial alternative.

Yes, I'm interested. Please send me more detailed information.

NAME _____ TITLE _____

COMPANY _____ PHONE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

D